United States Court of Appeals

for the

District of Columbia Circuit

TRANSCRIPT OF RECORD

18

IN THE

UNITED STATES COURT OF APPEALS

FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 24067

ALABAMA POWER COMPANY,

Petitioner,

v.

FEDERAL POWER COMMISSION,

Respondent.

UNITED STATES, ON BEHALF OF THE SECRETARY OF THE INTERIOR,

Intervener

ON PETITION FOR REVIEW OF ORDER OF THE FEDERAL POWER COMMISSION

JOINT APPENDIX

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TABLE OF CONTENTS

	Record Page	JA Page
Testimony of Malcolm Hay	43	1
Cross Examination	62	10
Testimony of Frank Rothberg	12	12
Cross Examination	144	36
Redirect Examination	173	39
Testimony of J. H. Miller, Jr.	210	40
Testimony of Elbert M. Rucker	485	73
Rebuttal Testimony of J. H. Miller, Jr.	754	83
Exhibit No. 1: Staff Report on Investigation of Headwater Benefits Coosa River Basin, January 1, 1961 through December 31, 1963	1174	110
Exhibit No. 2: Addendum to Staff Report on Investigation of Headwater Benefits, Coosa River Basin, January 1, 1961 through December 31, 1965	1215	141
Exhibit No. 24 - Stipulation	1258	150
Glossary of Power and Rate Terms	4219	152
Presiding Examiner's Initial Decision on Headwater Benefits Determination, Issued March 25, 1969	4292	154
Additional Findings and Conclusions	4322	190
Order	4322	191
Commission Staff Brief Opposing Exceptions	4435	192
Opinion and Order Determining Annual Charges for Benefits from Headwater Development	4534	194
Application for Rehearing of Alabama Power Company	4574	219
Opinion and Order Denying Applications for Rehearing and Motions for Stay and Oral Argument	4607	243

[43]

TESTIMONY OF H. MALCOLM HAY

Q. Please state your name and business address. A. H. Malcolm Hay, Federal Power Commission, 441 G Street, N.W., Washington, D. C.

Q. By whom are you employed and in what capacity? A. I am employed by the Federal Power Commission as Head of the Section of Headwater Benefits Investigations, in the Division of River Basins, Bureau of Power.

* * *

[47]

Q. I refer to Exhibit No. 1 entitled "Staff Report on Investigation of Headwater Benefits Coosa River Basin, January 1, 1961, through December 31, 1963, Docket No. E-6893," dated March 1965, with revision date of April 1965 and further revised by addendum dated January 1968, marked Exhibit No. 2, and ask you if these exhibits were prepared by you or under your supervision? A. They were prepared under my general supervision. Four copies of the original report were sent to each of the following parties:

Chief of Engineers, Department of the Army,
Assistant Secretary of the Interior, and
Alabama Power Company.

The reports were enclosed with letters dated March 5, 1965, stating the report was sent to afford each party ". . . an opportunity to make such comments or suggestions as you may deem appropriate prior to the time the staff submits its recommendations to the Commission."

Some revised pages were sent to the parties by letter dated April 19, 1965. The revisions made at that time were to correct mathematical errors.

Q. Were there other, later revisions of parts of Exhibit No. 1? A. Yes.

[48]

Q. Why were these other revisions made? A. For one thing, enclosed with a letter dated January 11, 1966, the Assistant Director of Civil Works for Atlantic Divisions, Corps of Engineers, Department of the Army, sent us new Allatoona project during calender year 1961. The new maintenance cost of joint-use facilities to be borne by power in 1961 was less than the maintenance cost used in our original computations. Since the Corps' letter stated that the revised maintenance figures were appropriate for computing the joint-use power costs at Allatoona in calender year 1961, we used the new figures and made the necessary ensuing changes.

Secondly, as we continued to analyze the benefits to Lay, Mitchell and Jordan attributable to regulation of streamflows by upstream reservoirs at Allatoona and Weiss we found that our original computations credited Allatoona with providing more energy gains than rightfully should be credited to Allatoona. This was because our computations gave credit to Allatoona for energy gains made possible by the storage of water at Weiss which would otherwise have been spilled at Lay, Mitchell, and Jordan, or at any one or two of these projects. Accordingly, we revised the energy gains at Lay, Mitchell, and

[49]

Jordan attributed to Allatoona by eliminating the effect on streamflows by regulation at Weiss.

Thirdly, the energy gains at Weiss attributable to Allatoona were revised by deleting the gains, both positive and negative, which had been computed for operations in the portion of the Weiss reservoir shown on Plate 3 in Exhibit 1 as Area B. (The storage delineation curve showing the boundary between Area B and Area A, that is between flood-control and power storage, was developed by the Alabama Power Company with the concurrence of the Corps

of Engineers.) The net effect was a reduction in the energy gains at Weiss attributed to Allatoona regulation.

Article 40 of the license for project No. 2146 stipulates that the operation of the Weiss reservoir in the interest of flood control shall be in accordance with such reasonable rules and regulations as may be prescribed by the Secretary of the Army. Instructions for such operations have been prepared by the Corps of Engineers representing the Secretary of the Army. These instructions require Alabama Power Company to discharge water continuously at a rate equal to the hydraulic

[50]

capacity of all three generating units when the surface of the water is in Area B. Accordingly, at such times, any water stored at Allatoona could not have been used at Weiss and, therefore, could not be considered to be a negative benefit on the day it was stored, and any water released from Allatoona could not have been used to generate additional energy at Weiss on the day the water was released from Allatoona, in both cases allowing for travel time. The purpose of the Corps' instructions is to lower the surface of the Weiss reservoir to rule-curve elevation as quickly as reasonably feasible; hence, an operation at Allatoona which would prolong the attainment of this objective has not been counted as a benefit.

Fourthly, the alternative source of incremental energy was modified, which in turn resulted in a change in the value of gains in hydroelectric energy.

Q. Will there be additional testimony on the subject of revisions to Exhibit No. 1? A. Yes. Exhibit No. 1 is revised by Exhibit No. 2, which is an addendum dated January 1968, has the same title as Exhibit No. 1, and contains the revisions which I have mentioned.

[51]

These exhibits include all the revisions discussed at the con-

[51]

ference of the interested parties held on January 18, 1966, in Washington, D. C., and those in our letter of January 27, 1966. The revisions to Exhibit No. 1, together with the original report, form the basis for the Commission's order issued September 28, 1966, requiring the Alabama Power Company to compensate the United States for headwater benefits provided in 1961-1963 by the Federal Allatoona project to the Company's downstream Coosa River hydroelectric plants. Mr. Frank Rothberg's testimony will explain the revisions made. Copies of the addendum were given to the parties present at the pre-hearing conference on February 14, 1968, representing the Alabama Power Company, the Secfetary of the Interior, and the Chief of Engineers, Department of the Army.

Q. What parts, is any, of Exhibit No. 1 did you prepare?
A. The substance of Exhibits No. 1 and No. 2 was prepared by Mr. Rothberg, with consultation and advice from me. I edited the texts.

Q. Please describe briefly the purpose of Exhibit No. 1 and how it was prepared. A. The exhibit was prepared to show: (1) the gains, if any, in dependable capacity and energy at the Weiss, Lay, Mitchell,

[52]

and Jordan hydroelectric plants of the Alabama Power Company in calendar years 1961, 1962, and 1963 as the result of the regulation of streamflows by the upstream federally owned Allatoona project; (2) to determine the value of these gains; and (3) to estimate the payment the Alabama Power Company should make to the United States for these benefits in accordance with the terms of Section 10(f) of the Federal Power Act. The procedure followed in computing the value of energy gains and payment therefor is substantially the same as that which was followed in computing the value of gains received at Lay, Mitchell, and Jordan during years 1950 through 1960 and the assessments for the gains in those years. This procedure is the same as that approved by the Federal Power Commission in its opinion and

order issued March 28, 1963, in Docket No. E-6468 (29 FPC 624), in which the Commission ordered the South Carolina Electric & Gas Company to make payments for headwater benefits received at its Stevens Creek hydroelectric plant. The Commission's determinations as expressed in its order were sustained by the United States Court of Appeals for the Fourth Circuit in a decision rendered November 9, 1964, (338 F 2d 898). The procedure is also the same as that approved by the Commission in its opinion and order issued February 17,

[53]

1967, in Docket No. E-6684 (37 FPC 340), in which the Commission ordered Virginia Electric & Power Company to make payments for headwater benefits received at its Roanoke Rapids hydroelectric plant.

Q. What benefits did you consider could have been provided by the Allatoona project to the Weiss, Lay, Mitchell, and Jordan hydroelectric plants of Alabama Power Company? A. The benefits considered were the increase in dependable capacity, if any, and the increase in energy at the four plants attributable to the operation of the Allatoona project. Mr. Rothberg's testimony will contain a detailed explanation of why there were no benefits in kilowatts of dependable capacity and how the benefits in kilowatt-hours of energy were computed, the amount of such benefits, how their value was determined, and of the computation of the payment to be made for them.

Q. Please describe the Allatoona project. A. The federally owned Allatoona project, located in northwest Georgia on the Etowah River about 48 miles upstream from Rome, Georgia, consists of a curved, concret gravity-type dam with a gated spillway, 4045 feet of earthfill saddle dikes on the left bank, a powerhouse on the left bank below the dam, and a switchyard and substation between the powerhouse and dam. The powerhouse contains two 36,000-kilowatt generating units

page 11 of FPC Form No. 12 is 69 feet. The drainage area above Lay Dam is about 9,087 square miles.

Q. Please describe the Mitchell Dam project of the Alabama Power Company. A. The Mitchell Dam project is on the main stem of the Coosa River about 14 miles downstream from Lay Dam. It is reported on page 433b of FPC Form No. 1 to be a run-of-river hydroelectric development. The project consists of a concrete, gravity-type dam with a gated spillway section and a powerhouse containing four generating units of equal size totaling 72,500 kilowatts of generating capacity. The gross head reported on page 11 of FPC Form No. 12 is 66 feet. The drainage area above Mitchell Dam is about 9,827 square miles. The project was completed in 1923 and was licensed by the Commission in 1921 as project No. 82.

Q. Please describe the Jordan Dam project of the Alabama Power Company. A. The Jordan Dam is on the main stem of the Coosa River about 19 miles downstream from Mitchell Dam. It is reported on page 433b of FPC Form No. 1 to be a run-of-river hydroelectric development. The project consists of a curved, concrete, gravity-type dam with a spillway section of 35 bays, of which 17 are equipped with vertical-lift gates and 18 are ungated, and a powerhouse which contains four units of equal size totaling 100,000 kilowatts of generating capacity. The gross head

reported on page 11 of FPC Form No. 12 is 88.7 feet. The drainage area above Jordan Dam is about 10,165 square miles. The project was completed in 1929 and licensed by the Commission in 1929 as project No. 618.

Q. What are the investment costs of the Allatoona project, including interest during construction. A. The investment costs of the Allatoona project are $33,024,978 for calendar year 1961; $33,137,879 for calendar year 1962; and $33,304,271 for calendar year 1963.

Q. How are these investment costs allocated? A. They are allocated to flood control, power, and public use. The dam and reservoir of the Allatoona project constitute what are considered to be the joint-use facilities and are the headwater improvements which provided headwater benefits to the Weiss, Lay, Mitchell, and Jordan projects during the period of January 1, 1961, through December 31, 1963. The Weiss project, however, began operation on June 5, 1961, and headwater benefits were provided only from that date through December 31, 1963. A portion of the investment in the joint-use facilities was allocated to power, a portion to flood control, and none to public use. Power and flood control also bear the cost of their individual specific facilities. All public-use costs are for specific facilities.

[59]

Q. What are the investment costs of specific power facilities? A. The costs of specific power facilities are $9,266,-682 for calendar years 1961, 1962, and 1963.

Q. What are the investment costs of specific flood control facilities? A. The costs of specific flood control facilities are $70,287 for calendar year 1961; $69,917 for calendar year 1962; and $69,535 for calendar year 1963.

Q. What are the investment costs of specific public-use facilities? A. The costs of specific public-use facilities are $514,497 for calendar year 1961; $637,688 for calendar year 1962; and $786,909 for calendar year 1963.

Q. What are the costs of joint-use facilities at the Allatoona project? A. They are $23,173,512 for calendar year 1961; $23,163,592 for calender year 1962; and $23,-181,145 for calendar year 1963.

Q. What portion of these joint-use costs is allocated to flood control? A. The portion of joint-use costs allocated to flood control is $7,223,313 in calendar year 1961; $7,-220,228 in calendar year 1962; and $7,225,687 in calendar year 1963.

[60]

Q. What portion of the costs of joint-use facilities at Allatoona is allocated to power? A. The portion of joint-use costs allocated to power is $15,950,199 in calendar year 1961; $15,943,364 in calendar year 1962; and $15,955,458 in calendar year 1963.

Q. What are the actual maintenance charges on that portion of joint-use facilities at the Allatoona project allocated to power? A. The actual maintenance charges are $21,943 in calendar year 1961; $23,466 in calendar year 1962; and $30,167 in calendar year 1963.

Q. What are the annual interest charges on the investment costs of the joint-use facilities allocated to power at the Allatoona project? A. The annual interest charges on the investment cost of joint-use facilities allocated to power are $398,755 in calendar year 1961; $398,584 in calendar year 1962; and $398,886 in calendar year 1963.

Q. What are the annual charges for depreciation on the investment costs of joint-use facilities allocated to power at the Allatoona project? A. The annual charges for depreciation are $163,649 in calendar

[61]

year 1961; $163,579 in calendar year 1962; and $163,703 in calendar year 1963.

Q. What are the total Section 10(f) costs (interest, maintenance, and depreciation) allocated to power at the Allatoona project? A. The total Section 10(f) costs allocated to power at the Allatoona project are $584,347 in calendar year 1961; $585,629 in calendar year 1962; and $592,756 in calendar year 1963.

* * *

[62]

CROSS EXAMINATION

BY MR. VOGTLE:

[85]

Q. Thank you. In that light, may I ask this question. Am I correct that the Staff has not in its calculations of energy gains at Alabama Power Company's four plants during this three-year period permitted Weiss to generate with natural inflow into Weiss without Allatoona regulation and permitted Lay, Mitchell and Jordan to generate with flows regulated only by Weiss? A. We have not done it that way.

* * *

[87]

Q. Thank you.

I refer you to pages 4 and 5 of Staff Exhibit 1. On page 4, subparagraph b, in the third sentence from the end of that paragraph, you refer to useable storage in the 7-foot maximum drawdown as 37,400 acre-feet as it relates to Lay Dam. Do you have that reference? A. Which page is that?

Q. It is page 4 of Exhibit 1. A. Yes.

Q. And on page 5 at the top of the page with respect to Mitchell Project, you refer to useable storage in the 6-foot drawdown below maximum power pool, elevation 312, as being 33,300 acre-feet? A. Yes.

[88]

Q. And for Jordan in the subparagraph d you refer to useable storage in the 10-foot maximum drawdown below full power pool, elevation 245, being 43,750 acre-feet.

Mr. Hay, has Staff in its determination of energy gains or losses at these three plants, Lay, Mitchell and Jordan, utilized these storage capacities to permit generation at these plants on days other than the day of arrival of Allatoona releases or, when Allatoona stored, on days other than the days Allatoona withholdings would arrive? A. We treated them as run-of-river plants. They are so stated in your Form 12.

Q. Mr. Hay, is it because Alabama Power Company in

[88]

filing Form 12 stated in the run-of-river column that Lay, Mitchell and Jordan were run-of-river projects that you have made that assumption? A. That influenced us to do it, yes.

Q. Well, in view of your recognition of this storage capacity in these three projects and further in view of your admitted failure to use it, is there any other reasons? A. Not that I know of.

* * *

[95]

MR. LEVANT: Staff calls as its next witness Mr. Frank Rothberg.

Whereupon,

FRANK ROTHBERG

was called as a witness and, having been first duly sworn, was examined and testified as follows:

[97]

TESTIMONY OF FRANK ROTHBERG

Q. Will you please state your name and business address? A. Frank Rothberg, Federal Power Commission, 441 G Street, N.W., Washington, D. C.

Q. Where are you presently employed? A. I am employed as a Hydraulic Engineer in the Section of Headwater Benefits Investigations, Division of River Basins, Bureau of Power, Federal Power Commission, Washington, D. C.

* * *

[100]

Q. I refer to Exhibit No. 1 entitled "Staff Report on Investigation of Headwater Benefits Coosa River Basin January 1, 1961, through December 31, 1963, Docket No. E-6893," dated March 1965, with revision date of April 1965 and further revised by addendum dated January 1968, marked Exhibit No. 2. What was your responsibility in the

preparation of these exhibits? A. I was responsible for the preparation of Exhibit Nos. 1 and 2. The methods and procedures used in the exhibits were established in collaboration with Mr. H. M. Hay, Head of the Section of Head-

[101]

water Benefits Investigations, who is also testifying in this hearing. I received assistance from other engineers on the staff in performing some of the computations.

Q. Would you describe the scope of your study in the preparation of Exhibit Nos. 1 and 2. A. The scope of the study, as reflected in Exhibit Nos. 1 and 2, encompasses what dependable capacity and energy benefits, if any, were received at the Coosa River hydroelectric plants of the Alabama Power Company from Allatoona reservoir regulation for the period January 1, 1961, through December 31, 1963, the monetary value of such benefits, and the payment to be made to the United States by the Company for these benefits.

Q. To what extent have revisions been made to Exhibit No. 1 by the addendum, Exhibit No. 2? A. Mr. Hay has testified in general about the revisions to Exhibit No. 1. I will refer to the revisions and incidental corrections of mathematical errors shown in Exhibit No. 2 during the course of my testimony.

Q. You have indicated that the period covered by this investigation was January 1, 1961, through December 31, 1963. Why does the period begin with January 1, 1961?

[102]

A. Dependable capacity and energy gain determinations at Lay, Mitchell, and Jordan plants have been made previously for the period from January 1, 1950, through December 31, 1960. Allatoona regulation began in December 1949. The Weiss reservoir project did not begin operating until 1961. The Company has made payments to the United States for energy gains its plants had received from Allatoona regulation during the 1950-60 period. The studies showed that no ca-

[102]

pacity gains were obtained at the Company plants in this period.

Q. What do you mean by energy gains at the Company plants attributable to Allatoona reservoir regulation? A. The energy gains at a hydroelectric plant downstream from one or more regulating storage reservoirs are measured by the difference between actual generation from the regulated streamflow and the computed generation from flow without such upstream regulation. In this case Allatoona regulates flow into Weiss, and both Allatoona and Weiss regulate the flow to Lay, Mitchell, and Jordan. It therefore must be ascertained what respective portions of the energy gains at Lay, Mitchell, and Jordan, provided by usable or beneficial flows, are attributable to regulation by the Allatoona reservoir and by the Weiss reservoir.

[103]

Q. What do you mean by usable or beneficial flow? A. Not all daily regulated water at the upstream reservoir, either stored or released, is usable or beneficial at all times at the downstream plants. Conditions could be such that when water from storage is added to the flow through the turbines the total flow would exceed the hydraulic capacity of the plant. The term beneficial or usable flow, as used in this study, is the amount of water stored or released daily at Allatoona or Weiss that produces or could produce additional energy at the Company's plants. Water released from Allatoona storage that is usable at the Company's plants for producing energy is considered a positive gain to the Company and credited to Allatoona. Water withheld and stored at Allatoona that could have been used at the Company's plants for producing energy is considered a negative benefit to the Company and is offset against positive gains credited to Allatoona.

Q. In your studies did you compute the energy gains provided by Allatoona regulation and by Weiss regulation? A. No. It was the objective of the study to determine

solely what benefits were provided the Company by Allatoona regulations for the period in question since we are only interested in determining the payment to be made for benefits provided by Allatoona.

[104]

Obviously any benefits provided by Weiss are of interest to the Company only. In our initial study, Exhibit No. 1, our computations inadvertantly resulted in crediting Allatoona with certain benefits resulting from Weiss regulation. This was subsequently corrected prior to the Commission's order of September 28, 1966, setting forth the proposed payment to be made to the United States for benefits provided by Allatoona regulation.

Q. How were the daily regulated flows at each downstream plant obtained? A. The daily flows which actually occurred at each of the Company plants, including the effect of upstream regulation, are recorded on a daily basis by the Company and are furnished the staff on operation data forms for each plant. Typical data sheets giving this daily information and other plant data are shown in Exhibit No. 1 as Tables 2, 3, 4, and 5.

Q. What does this regulated flow, as recorded, represent? A. These daily flows are the total flow through the turbines plus such flows as may flow over the spillway and through the sluices. We have considered this total flow to be the same as the daily inflow into the power pool.

[105]

Q. Is it not necessary to know the hydraulic capacity of the total turbine installation at each plant in order to determine the usable flow? If so, how was this hydraulic capacity determined? A. The hydraulic capacity of Lay, Mitchell, and Jordan, was determined for the prior headwater benefit determinations for 1950-1960 from a study of the performance data compiled for each of the plants. The capacities adopted were agreed upon by staff and the

[105]

Company. The hydraulic capacities are 17,850 cfs for Lay, 16,600 cfs for Mitchell, and 19,600 cfs for Jordan. The Weiss plant did not become operable until June 5, 1961. Two units were in service until July 5, 1962, when the third unit was placed in operation. From the data furnished by the Company, it was determined that the hydraulic capacity of the plant with two units is 18,000 cfs and with three units 26,000 cfs within the limits of the rule curve.

Q. What other information was furnished by the Company for the Weiss reservoir? A. Table 2 of Exhibit No. 1 shows average daily power pool and tailwater elevations with readings taken every hour and averaged for the 24 hours. The Company has also furnished us daily midnight reservoir elevations and the amount of water stored in, or drawn from, the Weiss reservoir during the day.

[106]

Q. What data were obtained for the Allatoona reservoir? A. Table 1 of Exhibit No. 1 shows a typical data sheet furnished by the Corps of Engineers, Mobile District Office, Mobile, Alabama, for Allatoona reservoir operations. It shows the reservoir elevations at 12:01 a.m. and the amount of water stored or drawn for the day.

Q. May the daily usable or beneficial flow at the Lay, Mitchell, and Jordan plants, attributable to each upstream reservoir, Allatoona or Weiss, be determined from these data? A. Yes. It can readily be determined.

Q. Will you please explain how you arrived at the amounts of daily usable flow at Lay, Mitchell, and Jordan as shown in Exhibit No. 1? A. Subparagraph c. on page 10 of Exhibit No. 1 explains the method used to determine the usable or beneficial flow attributable to the daily operation of each reservoir. By using this method, when Weiss reservoir is storing water, Allatoona was given credit for positive gains for its releases which it should not have received.

Q. Did you revise your study to eliminate this effect? A. Yes. We subsequently revised our study to correct this.

[107]

Q. How were the amounts of usable flow from Allatoona reservoir storage regulation then determined for the Lay, Mitchell, and Jordan plants as reflected in Exhibit No. 2? A. I first considered the travel time for releases from the reservoirs to reach the downstream plants. It had been determined in the previous investigations that it takes about three days for releases from Allatoona to reach the Lay, Mitchell, and Jordan plants. For this current study we used the same travel time, and about one day for Allatoona releases to reach Weiss. Therefore, Weiss releases take about two days to reach the Lay, Mitchell, and Jordan plants. These travel times were used in all of our current studies. Next we noted that the downstream plants, Lay, Mitchell, and Jordan, are run-of-river plants, as noted in the Company's filing of FPC Form No. 1. Since regulation at Allatoona reservoir affects the natural flows downstream from the dam it is necessary to know the volume change in the reservoir. The amount stored or released is measured on a 24-hour basis, from midnight to midnight and was furnished by the Corps. The Alabama Power Company furnished similar information for its Weiss reservoir. Using the operating data for the Lay, Mitchell, and Jordan plants, the storage changes at the reservoir, and taking into account the operating conditions prevailing at the reservoirs on any specific day, the amount of regulated water at Allatoona, either released or stored, that is used

[108]

beneficially, or, if stored, could have been used at the Company plants, can be determined.

The procedure used in determining the Allatoona daily regulated water which was beneficial to Lay, Mitchell, and Jordan is as follows. The flow at Lay, Mitchell, and Jordan, as regulated by Allatoona only, is obtained by adjusting the recorded flow at these plants by the amount of regulation

[108]

at the Weiss reservoir. If Weiss stored water, the amount was added to the total flow at the plants. If Weiss released storage water, the amount was subtracted from the total flow at the plants.

Since these plants are run-of-river plants and have sufficient pondage to regulate the daily inflows, the usable Allatoona regulated storage water was considered to be the actual amount released at Allatoona if the hydraulic turbine capacity of the plant was not exceeded by the flow thus adjusted. If the flow adjusted to include the release from Allatoona exceeded the hydraulic capacity of the turbines, it was assumed that the difference between the hydraulic capacity and the total flow would be spilled and the difference between the amount released from Allatoona and the amount spilled would be usable flow credited to Allatoona. Negative benefits resulted from water stored at Allatoona up to an amount which, when added to the adjusted flow, did not exceed the turbine capacity of the plant. Staff has

[109]

furnished the parties a complete set of daily energy computations made for Exhibit Nos. 1 and 2 for the three-year period 1961-1963.

Q. How did you arrive at the amount of Allatoona regulated storage usable at the Weiss storage project? A. The procedure for determining the daily amount of Allatoona regulated water which was beneficial to Weiss as used in Exhibit No. 2 is as follows. It was assumed that all Allatoona reservoir releases would be usable through the turbines upon its arrival at the plant, taking into account travel time of one day, even though it may have been stored for later use, as long as the power pool elevation for that day had not exceeded the rule curve which bounds Area A. See Plate 3, Exhibit No. 1. Similarly, when water is stored at Allatoona, it is assumed that the Weiss plant could have used the water up to turbine capacity and the excess, if any, placed in Weiss storage up to rule curve elevation, Area A.

Q. Does this criterion differ from that used in Exhibit No. 1 and, if so, in what respect? A. In Exhibit No. 1 we gave positive credit to Allatoona for use of all its regulated storage water at Weiss as long as the latter

[110]

did not spill water, even when operating in Area B. See Plate 3, Exhibit No. 1. When the water surface is in this Area, the plant discharge must equal the maximum capacity of all three units even if one or more units are not operating. In Exhibit No. 2 we deleted the gains credited to Allatoona when the water surface at Weiss was in Area B. This resulted in a reduction of 1,221,016 kwh.

Q. Why did you consider power storage at Weiss in Area A only in determining usable Allatoona regulated storage releases or water withheld that could be used for power generation at the Weiss plant? See Plate 3, Exhibit No. 1. A. The reservoir regulation manual for the Weiss project issued by the Corps of Engineers, Mobile District Office, shows that when the Weiss reservoir surface is above Area A. flood control operations at Weiss reservoir are required. Since usable Allatoona regulated storage is determined on a daily basis and since the units at Weiss must operate at maximum turbine capacity, Allatoona releases, or water withheld, were considered not to be usable since any water stored at Allatoona could not have been used at Weiss and, therefore, could not be considered to be a negative benefit on the day it was stored, and any water released from Allatoona could not have been used to generate

[111]

additional energy at Weiss on the day water was released from Allatoona, in both cases allowing for travel time. The instructions in the manual require that the surface of Weiss reservoir be lowered to Area A as quickly as reasonably possible. With this requirement, the attainment of this objective precludes the assumption that credit should be given

[111]

to Weiss for its ability to store additional water above Area A from daily Allatoona storage regulation.

Q. Will you describe how the energy gains at Weiss were computed? A. Table 6 of Exhibit No. 1 is typical of energy gain computations for the Weiss plant and shows the daily energy gains resulting from Allatoona reservoir regulation for May 1963. The columns showing Allatoona Res. Reg., Gross Gen., Turbine Flow, and Spillage, were obtained from the data furnished by the Corps of Engineers and the Company. See Tables 1 and 2 of Exhibit No. 1 Energy gains at Weiss resulting from Allatoona reservoir regulation were computed daily. Energy gains or losses at Weiss were computed by multiplying the Allatoona daily additions to, or reductions in, usable flow at Weiss by the Unit Output (kwh-per-dsf), or "K" factor, for the day, as determined from the actual gross generation and turbine-use records. The "K" factor is obtained by dividing generation by the average daily turbine

[112]

flow. In these computations it was assumed that the ratio of the daily energy output to the flow through the turbines at Weiss would have been the same for any particular day with or without Allatoona regulation. On days when storage is being released from Allatoona and spilling is not occurring at Weiss, all such Allatoona water is considered usable for energy generation, provided the Weiss reservoir level does not exceed rule curve elevation of Area A. On days when water is being stored at Allatoona, such storage is considered a negative benefit to Weiss up to an amount not exceeding the difference between the flow through the turbines and the hydraulic capacity of the plant generating equipment, provided the Weiss reservoir surface does not exceed rule curve elevation of Area A. If the rule curve is not exceeded and there is excess Allatoona water after use to full turbine capacity, this excess was considered as stored in the Weiss reservoir if it did not cause the water surface

level to exceed the day's rule curve elevation. Negative energy benefits resulting from use of this storage water were based on the "K" factor derived from the actual energy generation for the day. Table 7 of Exhibit No. 2 shows monthly energy gains credited to Allatoona regulation for the Weiss plant for the period covered by this study.

[113]

Q. What are the computed energy gains at the Weiss plant by years for the period 1961-1963? A. Using the method and criteria just described, the computed energy gains at Weiss resulting from regulation at Allatoona reservoir are 6,278,870 kilowatt-hours for the period June 5, through December 31, 1961; 11,984,601 kilowatt-hours for the year 1962; and 16,504,962 kilowatt-hours for the year 1963; a total of 34,768,433 kilowatt-hours.

Q. Will you describe in detail how the daily energy gains at the Lay, Mitchell, and Jordan plants were computed? A. Tables 8, 9, and 10, of Exhibit No. 2 are typical of daily energy gain computations for the three-year period for the Lay, Mitchell, and Jordan plants, respectively. These tables show computations for May 1963. The columns show Allatoona and Weiss reservoir regulation and gross generation, turbine flow, and spillage, at each downstream plant. These basic data were furnished by the Corps of Engineers and the Company. See Tables 1, 3, 4, and 5 of Exhibit No 1. Daily Weiss reservoir regulation was also furnished by the Company. In general, the energy benefits to the three plants are computed in a manner similar to that used at the Weiss project, that is we assumed that each day-second-foot of water, regulated or unregulated,

[114]

passing through the turbines at each plant on a given day would produce equal amounts of energy. Daily flows adjusted to eliminate the effect of regulation by Weiss were used as the basis for obtaining the "K" factors in the com-

[114]

putations of energy gains at Lay, Mitchell, and Jordan attributable to Allatoona regulation. These flows are shown as "Flow W/O Weiss Reg." in Tables 8, 9, and 10. The daily "Usable Allatoona Reg. Flow" at each plant (see Tables 8, 9, and 10) used in computing the energy gains at Lay, Mitchell, and Jordan attributable to Allatoona regulation is the total amount of Allatoona daily regulation as long as the hydraulic capacity of the plant is not exceeded with its use. If Allatoona is releasing stored water and the "Flow W/O Weiss Reg." at either Lay, Mitchell, or Jordan, exceeds its hydraulic capacity by less than the storage released from Allatoona, then the difference between the amount released from Allatoona and the amount spilled at the plant is considered usable Allatoona regulated flow through the turbines. There are no negative benefits on days when water is stored at Allatoona if the flow at the downstream plant is at, or exceeds, the hydraulic capacity of the plant. Negative benefits, however, have been allowed up to the hydraulic capacity of the plant if the flow, without Weiss regulation, is below hydraulic capacity and water is being stored at Allatoona.

[115]

In determining energy gains, the assumption is made that a turbine is operated, whenever possible, so as to produce the maximum amount of power per cfs. This is accomplished when the turbine is operating at best efficiency (best gate). When turbine flow exceeds that at which best-gate operation can be accomplished, it is assumed that turbines are operated at full-gate. The estimated maximum total plant turbine flows with which operation at best-gate can be accomplisned and the corresponding "K" factor for best-gate for each plant are as follows. For the Lay plant–16,000 cfs with a "K" factor of 114; for the Mitchell plant–13,500 cfs with a "K" factor of 113; and for the Jordan plant–16,000 cfs with a "K" factor of 154. The estimated maximum total plant turbine flows for full-gate operation and

the corresponding "K" factor for full-gate for each plant are as follows: For the Lay plant—17,850 cfs with a "K" factor of 104; for the Mitchell plant—16,000 cfs with a "K" factor of 104; and for the Jordan plant—19,600 cfs with a "K" factor of 145. The assumed "K" factor for full-gate operation is used when the unregulated flow is greater than the flow for best-gate operation but the regulated flow (actual flow) is equal to or less than the maximum best-gate flow. The assumed "K" factor for best-gate operation is used when the unregulated flow is less than maximum best-gate flow but the regulated flow

[116]

(actual flow) exceeds the maximum flow for operation at best-gate.

Daily "K" factors are computed and used when: (1) the actual flow through the plant and the flow as adjusted to eliminate the effect of regulation by Weiss and water withheld, if any, at Allatoona do not exceed best-gate flow, and (2) both actual and adjusted flows exceed those for best-gate operation. In computing the energy gains for any given day the "Usable Allatoona Reg. Flow" is multiplied by the applicable "K" factor (kwh/dsf) which is dependent on the amount of "Flow w/o Weiss Reg." considered to be passing through the plant turbines. May 13 in Tables 8, 9, and 10, is a typical day when computations were made for full-gate operation when, under actual conditions, plant operations were at best-gate. Table 11 of Exhibit No. 2 shows monthly energy gains credited to Allatoona regulation for the Lay, Mitchell, and Jordan plants for the three-year period covered by this study.

Q. What are the computed energy gains at Lay, Mitchell, and Jordan by years for this study? A. The computed energy gains at Lay, Mitchell, and Jordan resulting from Allatoona regulation only are 37,215,419 kilowatt-hours for the year 1961; 50,304,340 kilowatt-hours for the year 1962;

[117]

and 71,036,141 kilowatt-hours for the year 1963; for a total of 158,555,900 kilowatt-hours.

Q. What are the total energy gains attributable to Allatoona regulation at the four Company plants by years for the period of study? A. The total computed energy gains for each year of the 1961-1963 study attributable to Allatoona reservoir regulation are 43,494,289 kilowatt-hours for the year 1961; 62,288,941 kilowatt-hours for the year 1962; and 87,541,103 kilowatt-hours for the year 1963; for a total of 193,324,333 kilowatt-hours.

Q. Did you check the energy gains appearing in the Commission's order of September 28, 1966, for the 1961-1963 period? A. Yes. In preparing Exhibit No. 2 we rechecked all computations and uncovered errors in some of our mathematical computations for the daily energy gains. This resulted in a reduction in the amount of gains by 215,873 kilowatt-hours below that on which the Commission order is based.

Q. You have discussed your study in arriving at energy benefits at the Company's Coosa River plants attributable to Allatoona reservoir regulation, did you also make a study of possible gains in dependable capacity considering the effect of Allatoona regulation?

[118]

A. Yes, I did. FPC Form No. 12, Schedule 16, defines dependable capacity of hydroelectric plants operating in a system as follows: "The dependable capacity of system hydro plants relates to the capacity which under the most adverse flow conditions of record can be relied upon to carry system load, provide dependable reserve capacity, and meet firm power obligations, taking into account seasonal variations and other characteristics of the load to be supplied and of the firm power obligations." I first investigated the possibility of dependable capacity gains during the critical dry period. The Alabama Power Company operates

in an integrated system known as the Southern Company system. Thus any plant in this system is available to supply capacity and energy to meet the system load requirements. The companies comprising this operating system are the Alabama Power Company, the Georgia Power Company, the Gulf Power Company, the Mississippi Power Company, and the Southern Electric Generating Company. Only the Alabama Power Company and the Georgia Power Company operate hydroelectric plants in the Southern Company system.

The Alabama Power Company added the Weiss reservoir project to its system operation in June 1961. Weiss storage, in addition to the storage at Allatoona, provides regulation for the downstream Lay, Mitchell, and Jordan plants.

* * *

[126]

Q. Your testimony shows that the Allatoona project provided the Company's four Coosa River plants with energy gains for the years 1961-1963. How did you determine what payment the Company should make to the United States for these energy gains resulting from Allatoona regulation? A. Page 5, Section VI, of Exhibit No. 1 shows the method we used for computing payments for headwater benefits. Payment was determined in accordance with Section 11.27(b) of the Regulations under the Federal Power Act which provides, in essence, that the portion of the annual cost of interest, maintenance, and depreciation on the joint-use facilities at the headwater improvement to be borne by power, referred to as Section 10(f) costs, both at site and downstream, is to be equitably apportioned among the power plants benefited. Accordingly, the actual annual costs of interest, maintenance, and depreciation on the joint-use facilities to be borne by power at Allatoona have been apportioned according to the annual monetary value

[127]

of the at-site power and of the gains received at the down-

[127]

stream plants of the Alabama Power Company. Hence, the payment to be made by the Company to the United States (P_n) for benefits received at each plant from Allatoona is equal to the annual 10(f) costs of the Allatoona dam and reservoir (C_p) multiplied by the fraction composed of the net annual monetary value of benefits received at a Company downstream plant (V_n) over the sum of the annual monetary value of the Allatoona improvement to at-site power production (V_f) plus the net monetary value of benefits received at all the Company downstream plants (V_d), or P_n is equal to C_p multiplied by V_n over the quantity V_f plus V_d.

Q. How did you determine the monetary value of the energy gains attributable to Allatoona reservoir regulation? A. If the additional energy obtained at the Company's Coosa River plants were not available as a result of regulation of flows by Allatoona Reservoir, it would have been necessary for the Alabama Power Company to obtain equivalent energy from an alternative source to supply its system load, and most likely from some plant or plants in the Company's steam-electric system. The net monetary value of the energy gains at the Company's plants is the difference between the higher incremental cost of producing steam-electric energy at the alternative source

[128]

and the lesser incremental cost of generating energy at the Company's Coosa River plants.

Q. What steam-electric plants did you consider for the alternative source? A. Steam-electric generating plants operating in the area of the hydro plants, which is also the area of the largest load center of the Alabama Power Company, were selected as being the alternative source for the added hydro energy. In Exhibit No. 1 we used the two units comprising the Gadsden steam plant, the four units of the Gorgas No. 2 plant, and the two units of the Gorgas No. 3 plant, as the alternative source. Their total installation is 894,900 kilowatts. These units represent both high

[129]

and low cost steam-electric energy production and were considered representative of the type of untis that would produce added energy in lieu of energy gains at the Company's hydro plants. They operate at plant factors which would enable them to supply the alternative energy. However, upon further study of the alternative source of supply, we decided that the remaining steam plant in this area, the Gaston (or SEGCO) plant, should be added. This plant is owned in equal partnership by the Alabama and Georgia Power Companies and is the lowest production cost steam plant in the Alabama Power Company system.

[129]

It has an installation of 1,080,000 kilowatts. Thus, the Gadsden, Gorgas (No. 2 and No. 3), and Gaston plants are the alternative energy source used in Exhibit No. 2. Exhibit No.   is a map furnished by the Alabama Power Company, dated January 1, 1964, and titled Alabama Power Company Electric System, on which I have circled the Company's steam-electric plants and its hydro-electric plants on the Coosa River.

Q. How did you arrive at the estimated Incremental cost of producing steam-electric energy at the three plants? A. The data for determining the incremental production costs at the Gadsden and Gorgas plants were obtained from FPC Forms No. 1 filed by the Alabama Power Company, which are the annual financial reports of the operation of this public utility for its electric system. Data for the Gaston plant were obtained from FPC Forms No. 1 filed by the Southern Electric Generating Company, which is a company formed by the Alabama and the Georgia Power Companies to operate the plant. Additional data were also obtained from letters submitted by the Alabama Power Company. For the years 1962 and 1963 the incremental components of the reported production expenses at these plants, considered to be associated with energy generation, are 90 percent of the total fuel cost, FPC Account 501; plus maintenance of boiler plant

[130]

equipment, FPC Account 512; maintenance of electric plant, FPC Account 513; maintenance of miscellaneous steam plant, FPC Account 514; and a prorata share of maintenance supervision and engineering, FPC Account 510. These account numbers were adopted by the Federal Power Commission as part of its Uniform System of Accounts for use beginning January 1, 1961. However, the Company used the breakdown of costs and account numbers in effect before 1961 in Form No. 1 for 1961. Therefore, for the year 1961 the incremental cost of the alternative energy is based on the use of 90 percent of the total fuel cost and 30 percent of the total production expenses (operation and maintenance costs) exclusive of fuel cost which was the method used in the prior investigations of headwater benefits. Data in Form No. 1 for the Gaston plant for the years 1961, 1962, and 1963, was prepared in the same manner as described above. However, fuel costs shown in Forms No. 1 included a return allowance (Company's coal mine operations) representing other than actual costs incurred. The staff, therefore requested the Company to submit revised fuel costs for the Gaston plant in accordance with the requirements of Account 501, Fuel, FPC Uniform System of Accounts, dated 1961, with which it was instructed to comply in a letter dated May 26, 1964, from FPC's Office of Accounting and Finance. Revisions were made to the fuel costs shown

[131]

in Forms No. 1 for 1961, 1962, and 1963, using data in Alabama Power Company's letter of reply dated May 12, 1966. The other total costs shown in Form No. 1 for this plant for the accounts used in this study were prorated on the basis of energy from the plant sold to the Georgia Power Company and the Alabama Power Company.

The average incremental unit cost of the total of all generating units at each plant used was computed for each year.

The average of the individual plants for each year was then used as the average incremental unit production cost for the alternative energy source for that year. In Exhibit No. 1 the incremental unit production cost for each year was the average of the costs for the Gadsden, Gorgas No. 2 and Gorgas No. 3 plants. In Exhibit No. 2 it is the average of the units costs of the Gadsden, Gorgas (No. 2 plus No. 3), and Gaston plants. Table 13 (sheets 1 and 2) shows all pertinent data used in this computation of the incremental production expense of the alternative steam-electric energy and the average unit incremental cost used for each year.

Q. What are the unit values? A. The unit incremental cost of producing steam-electric energy at the alternative source as used for Exhibit No. 2 are 2.424, 2.473, and 21.-461 mills per kilowatt-hour for the years 1961,

[132]

1962, and 1963, respectively. This is a reduction from those in Exhibit No. 1 which are 2.522, 2.511, and 2.571, respectively.

Q. How were the incremental costs computed for generating the additional energy at the Company's Coosa River hydroelectric plants? A. The incremental costs associated with the production of energy gains at the Company's Coosa River hydroelectric plants resulting from regulation at Allatoona are those costs incurred which are attributable to and directly proportional to increases in generation at those plants. Such incremental costs include plant maintenance, state generation taxes, and the incremental cost of license fees. The unit cost used for plant maintenance is the average of such costs of the four plants, Lay, Mitchell, Jordan, and Weiss.

Maintenance costs for the plants are reported annually by the Company in Form No. 1. These data were submitted in this Form for the years 1962 and 1963, but were omitted in 1961 and subsequently furnished by the Company by letter dated March 6, 1963. The only maintenance costs

[132]

considered to be substantially proportionate to added generation are those listed as FPC Account 544, maintenance of electric plants, and FPC Account 545, maintenance of miscellaneous hydraulic plant. To these costs were added

[133]

a prorata share of FPC Account 514, maintenance supervision and engineering. The average incremental cost of maintenance was computed to be 0.072, 0.063, and 0.064 mills per kilowatt-hour for the years 1961, 1962, and 1963, respectively.

The State of Alabama imposes a tax of 0.40 mills per kilowatt-hour on hydroelectric energy generated in Alabama and sold only within the State. This is a cost that would not be incurred if the equivalent energy gains were obtained from the alternative steam-electric energy source. The unit tax rate resulting from the total amount paid the State by the Company for such generation from all its State hydro plants is 0.268, 0.266, and 0.296 mills per kilowatt-hour for the years 1961, 1962, and 1963, respectively.

Part I of the Federal Power Act imposes a charge on energy generated at a licensed hydroelectric plant for the purpose of reimbursing the United States for the cost of administering Part I of the Act. Such a charge is considered an incremental cost of hydroelectric generation at the four plants. The charge for the period covered by this investigation was 0.025 mills per kilowatt-hour.

Q. What unit values were used for the total incremental costs for generating the additional hydro energy?

[134]

A. The unit values are 0.365, 0.354, and 0.385 mills per kilowatt-hour for the years 1961, 1962, and 1963, respectively.

Q. How was the net value of the energy gains at the

Coosa River plants determined? A. For each year considered, the average unit incremental cost of generation at the Coosa River plants was subtracted from the unit incremental cost of producing steam-electric energy at the alternative source to obtain the net unit value of the energy gains.

Q. What are those unit values? A. The net unit value to be applied to the energy gains are 2.059, 2.119, and 2.-076 mills for kilowatt-hour for the years 1961, 1962, and 1963, respectively.

Q. What are the resulting net monetary values of the energy gains by years? A. The net monetary values of energy gains are $89,555, $131,999, and $181,735 for the years 1961, 1962, and 1963, respectively. The total of the values for the period January 1, 1961, through December 31, 1963, is $403,281.

Q. Are those the amounts used for V_n, and also in this case for V_d, in the apportionment formula described in Exhibit No. 1, page 6?

[135]

A. Yes, they are.

Q. How was the value of power produced at Allatoona determined? A. The value of power produced at Allatoona is considered equal to the total annual costs assigned to power by the Corps of Engineers. The Southeastern Power Administration, in marketing power under the provisions of Section 5 of the Flood Control Act of 1944, sells the power at rates to cover these costs. The annual power costs are the sum of the total annual costs of specific power facilities and that portion of the total annual costs of the joint-use facilities to be borne by power. Specific power facilities are of value to the at-site Allatoona plant only, whereas, joint-use facilities consisting of the dam and reservoir provide benefits both to Allatoona and the downstream Coosa River power plants. Therefore only the annual cost of the joint-use facilities allocated to power is used to represent the value of the Allatoona headwater improvement to at-

[135]

site power production. The same basis for representing the value of at-site power at Allatoona was used in the previous investigations for the Coosa River for the period 1950-1960. It is also the basis for headwater payments assessed in other river basins including the Savannah and Roanoke Rivers. This cost is composed of the annual charges for interest, depreciation.

[136]

operation and maintenance, interim replacements, and insurance. Only interest, depreciation, and maintenance costs, 10(f) costs, are approtioned between the at-site plant and the downstream plants benefiting from regulation of the reservoir at the at-site plant.

Q. How were the capital costs of the joint-use facilities obtained for the Allatoona project as used in this investigation? A. These costs as well as other capital or investment costs were furnished by the Mobile District Office of the Corps of Engineers. Mr. Hay, in his testimony, has given total capital costs for the Allatoona project as well as a breakdown of these costs as they apply in the determination of the payment to be made for the energy gains received by the Company.

Q. I understand that Mr. Hay testified as to other Allatoona costs involved in the payment by the Company for energy gains received? A. Yes. Mr. Hay has given the costs for each year of this investigation which provide the information for the values which I have used in the apportionment formula shown on page 6 of Exhibit No. 1.

Q. What value did you use for C_p in the formula? A. This is the annual 10(f) cost of Allatoona dam and reservoir to be borne by power both at-site and downstream, and is composed of interest, maintenance, and depreciation. Mr. Hay

[137]

testified that these are \$584,347 in calendar year 1961, \$585,629 in 1962, and \$592,756 in 1963. However, the

Weiss plant did not commence commercial operation until June 5, 1961, so its apportioned share would only be from that day to the end of the year for 1961.

Q. What costs did you use to determine V_f in the formula? A. V_f represents the annual value of Allatoona at-site power production and is the annual cost of the joint-use facilities allocated to power. This cost is composed of the annual 10(f) cost plus the operation cost, cost of interim replacements, and insurance cost estimated at 0.10 percent.

Q. What are the actual operation charges on that portion of the joint-use facilities at the Allatoona project allocated to power? A. The operation charges in Exhibit No. 2 are different from those in Exhibit No. 1 for the year 1961 only. That is because the Corps had furnished a breakdown of operation and maintenance costs for 1961 which were not in accord with that required for a headwater benefits study. The Corps furnished new cost figures for 1961 which showed revised operation charges to be $44,769 against the previous cost of $10,699. Maintenance cost was reduced from $51,-172 to $21,943. The

[138]

actual operation charges used in Exhibit No. 2 are $44,769 for calendar year 1961; $44,257 for 1962; and $54,605 for 1963.

Q. What are the annual costs for interim replacements on that portion of the joint-use facilities at the Allatoona project allocated to power? A. The annual costs for interim replacements are $4,800 for each of the years 1961, 1962, and 1963.

Q. What are the estimated annual charges for insurance on that portion of the joint-use facilities at the Allatoona project allocated to power? A. The estimated annual charges for insurance are $15,950 for the year 1961; $15,943 for 1962; and $15,955 for the year 1963.

Q. Mr. Hay has given us the 10(f) costs and you have given us the other annual costs of the components making up the annual values of V_f. What are the V_f values for the

[138]

period of this study? A. The annual values of V_f in the apportionment formula are $649,866 for the year 1961; $650,629 for 1962; and $668,116 for 1963.

Q. In the previous testimony you have given us the various components on the right-hand side of the payment formula shown on page 6 of Exhibit No. 1 for each of the years covered by this investigation. What did you do next to compute the payments to be made for energy gains?

[139]

A. The apportionment formula was applied for each year to determine the payment for that year. Actually, if all the projects involved are operable for the entire year, it is a simple matter of substitution in the formula to obtain the payment for any year. However, in the year 1961 the Weiss project did not begin generation for commercial operation until June 5. Therefore, from January 1 until June 5, 10(f) costs for this period were apportioned only among Allatoona, Lay, Mitchell, and Jordan. Weiss was included with the other projects in the apportionment for the remainder of the year's 10(f) costs.

Q. How was the proposed payment for headwater benefits for the year 1961 computed? A. As I have stated, 1961 was divided into two periods for the purpose of computing the payment for the year. From January 1 through June 4 covers a period of 155 days, from June 5 through December 31, 210 days. The monetary value of the energy gains for each period was determined by adding the daily energy gains in that period and multiplying by the incremental unit value of the added energy. Since the 10(f) cost and the monetary value used for at-site power production are not readily determinable other than on an annual basis, the value for each period was based on a ratio of the number of days in each period to the total days in the year.

[140]

Q. What were the energy gains for each period of 1961? A. For the first part of the year the total energy gains were 9,263,033 kwh, and for the last part of the year 34, 231,-256 kwh.

Q. What values were used in the apportionment formula for each of these periods for 1961? A. The components used in applying the formula to each of the periods are: for the period January 1 through June 4, C_p is \$248,147, $V_n$and V_d are \$19,073; and V_f is \$275,970; for the period June 5 through December 31, C_p is \$336,200, V_n and V_d are \$70,482, and V_f is \$373,896.

Q. What values were used in the apportionment formula for the years 1962 and 1963? A. The components used in the formula for these years are: for 1962, C_p is \$585,-629, V_n and V_d are \$131,991, and V_f is \$650, 629; for 1963, C_p is \$592,756, V_n and V_d are \$181,735, and V_f is \$668,116.

Q. What payments are due the United States when the components are substituted in the formula? A. The computed payments to be made to the United States by the Alabama Power Company for headwater benefits are: \$16,-041 for the period January 1 through June 4, 1961, \$53,-324 for the

[141]

period June 5 through December 31, 1961, for a total of \$69,365 for the year 1961; \$98,768 for the year 1962; and \$126,756 for the year 1963. The total of these proposed payments is \$294,889. the computation of these amounts together with a summary of the components used in the formula is shown on page 18, revised November 1967 and attached to Exhibit No. 2.

Q. The total payment just given as due the United States does not agree with the amount shown in the Commission order dated September 28, 1966, which showed a total amount due as \$296,003. Please explain the difference.

[141]

A. In the course of preparing Exhibit No. 2 we have rechecked our computations and in so doing found some errors in the mathematics of our energy gain computations. This resulted in the computed payment being $1,114 too great. The payment figure of $294,889 reflects this adjustment.

Q. Is $294,889 the amount which you have computed and recommend that the Alabama Power Company pay to the United States for headwater benefits at their Weiss, Lay, Mitchell, and Jordan plants attributable to the regulation of the Federally owned Allatoona project and that this amount is for the period January 1, 1961, through December 31, 1963? A. Yes.

[142]

Q. Section 10(f) of the Federal Power Act provides that the affected parties shall pay to the United States the cost of making this study. Have you determined what the cost to the Commission has been. A. Yes, I have. As of April 1, 1968, the cost of the study to the Commission for making the headwater benefits determination for the period January 1, 1961, through December 31, 1963, is $29,212.

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[144]

CROSS EXAMINATION

BY MR. VOGTLE:

Q. Mr. Rothberg, have you ever been employed in a position where you had the responsibility for the day-to-day operation of a power system having both hydro and steam electric generation? A. No, sir.

Q. On page 5 of your testimony you refer to payments by Alabama Power Company to the United States for energy gains at its plants on the Coosa River attributable to Allatoona during the period 1950 to 1960. A. You say that is page 5?

Q. I beg your pardon, page 5, yes, sir–excuse me, page

6 and it is line 5. I beg your pardon. It is the second from the last sentence in your first answer. These payments, did they not, related to gains at Lay, Mitchell and Jordan plants before Weiss was constructed? A. Yes.

Q. And these payments, were they not, during that period were the result of negotiation and compromise, were they not? A. Yes.

Q. In this proceeding, we are now concerned with energy gains at Weiss, Lay, Mitchell and Jordan during this period, is that correct?

[145]

A. Correct.

Q. And these four plants are all downstream from Allatoona, is that correct? A. Yes.

Q. Now, when Weiss was placed in operation in 1961, was it located or placed in operation between the Federal headwater improvement Allatoona and the three downstream plants, Lay, Mitchell and Jordan? A. Yes.

Q. During the period, 1961 to 1963, except for a few months in 1961 before Weiss commenced operation, Alabama Power Company operated all four of these plants under licenses issued by the Federal Power Commission, is that correct? A. Would you read that?

(Reporter read back record.)

THE WITNESS: Correct.

BY MR. VOGTLE:

Q. And during this three-year period, Alabama Power Company operated an integrated and coordinated electric system, did it not? A. Yes.

Q. In the last sentence on page 6, you state it therefore must be ascertained what respective portions of the energy gains at Lay, Mitchell and Jordan provided by useable or beneficial flows are attributable to regulation by the

[146]

Allatoona Reservoir and by the Weiss Reservoir. Do I in-

terpret correctly, Mr. Rothberg, in estimating energy gains at Lay, Mitchell and Jordan you first adjusted flows at these three plants to eliminate the effect of Weiss regulation? A. Yes, sir.

Q. In other words, energy gains at those three plants were determined only after Weiss in effect had been removed or eliminated from the river? A. Yes, sir.

Q. You state in your second answer on page 6 in the first sentence that the energy gains at a hydroelectric plant downstream from one or more regulating storage reservoirs are measured by the difference between actual generation from the regulated stream flow and the computed generation from flow without such upstream regulation.

Now, actual recorded generation at Lay, Mitchell and Jordan during this period, 1961 to 1963, except before Weiss went into operation, represents generation with Allatoona and Weiss regulation, does it not? A. Yes, sir.

Q. Did you in fact determine energy gains at Lay, Mitchell and Jordan by computing the algebraic sum of actual recorded generation at these plants with Allatoona and computed generation at these plants without Allatoona? A. No, sir. We had no idea what Weiss contributed.

[147]

Q. In other words, when you say that the energy gains at these plants are to be measured by the difference between actual generation and computed generation, you did not in fact ever find "actual generation" or use "actual generation" in determining gains at these plants? A. No, we did not.

Q. On page 11 of your testimony, you refer to generally the determination of useable flow at Lay, Mitchell and Jordan. Have you in your computation of the energy gains at Lay, Mitchell and Jordan during this period treated turbine discharge at each plant as always equal to inflow at that plant? A. Yes.

Q. This is a non-recognition of storage capacity at Lay, Mitchell and Jordan, is this not? A. Yes.

Q. You state in your first answer on page 9 that the hydraulic capacity of Lay, Mitchell and Jordan was determined for the prior headwater benefit determinations for 1950-1960 from a study of the performance data compiled for each of the plants. Was this performance data which you studied data which related to the condition of the turbines at Jordan before or after the original cast iron turbine runners at that plant were replaced by steel turbine runners? A. Well, the data we studied was supplied by the Alabama Power Company; and if I recall, it included up to about 1952,

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[173]

REDIRECT EXAMINATION

BY MR. LEVANT:

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[174]

Weiss Reservoir and they were discharging and we were also —and Allatoona was also discharging water, we had to assume that they could not use that water also. And that was the basis of it, why we took out positive gains also.

BY MR. LEVANT:

Q. In computing the benefits to Lay, Mitchell and Jordan provided by Allatoona, would you explain how you treated benefits, if any, which might have been provided by Weiss to Lay, Mitchell and Jordan? A. Actually, in computing the benefits we assumed, or did assume and made the study in that manner that all benefits resulting from Weiss were incremental to those of Allatoona. And the reasoning behind that was that Allatoona had been built, oh, some 10 years prior to Weiss. And any benefits that was attributable to Allatoona and furnished the benefit-cost ratio were benefits at Lay, Mitchell and Jordan that Allatoona contributed. Therefore, we assumed that any additional benefits to Lay, Mitchell and Jordan would have to be in-

[174]

cremental because two plants cannot furnish—we assume they would not furnish the same benefits, else, you did not—well, there was no comprehensive development of the river in that manner because you just weren't getting a positive benefit-cost ratio.

Q. Your were asked a question with reference to the determination of the value of the benefits based on the operation

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[183]

J. H. MILLER, JR.

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[210]

BEFORE THE
FEDERAL POWER COMMISSION

In the Matter of:
Alabama Power Company — Docket No. E-6893

DIRECT TESTIMONY OF
J. H. MILLER, JR.

Q. Please state your name and address. A. I am J. H. Miller, Jr., I live in Brimingham, Alabama and reside at 2683 Montevallo Road.

Q. Please state your education and your present employer. A. I graduated from Tulane University, New Orleans, Louisiana in 1943 with degree of Bachelor of Engineering in Electrical Engineering. I then had three years in the Navy during World War II with primary duties in installation, operation and repair of electrical equipment aboard naval vessels. I was employed by Alabama Power Company in May, 1946, and have been continuously in its employment since that date except during the Korean conflict when I had two additional years of military service with primary duties similar to those described above.

Q. What has been your experience with Alabama Power Company and what are your present duties?

* * *

[213]

operated by the Company during this period under licenses issued by the Federal Power Commission? A. Yes. Lay Dam Project was licensed by the Federal Power Commission as a part of Project No. 2146 by order issued September 4, 1957, as amended and supplemented. This project was originally placed in operation in 1914 pursuant to War Department Permit issued prior to enactment of the Federal Water Power Act of 1920.

Mitchell Dam was placed in operation in 1923 as Project No. 82 pursuant to license issued by the Federal Power Commission on June 27, 1921.

Jordan Dam was placed in operation in 1929 as Project No. 618 pursuant to license issued by the Federal Power Commission on November 7, 1925.

Weiss Dam was licensed by the Federal Power Commission as a part of Project No. 2146 by the aforesaid order of September 4, 1957, as amended and supplemented. Weiss Reservoir filling began on March 28, 1961. The first unit at Weiss (Unit #3) was first started on May 10, 1961, and was placed in commercial operation on June 5, 1961, approximately five months after the beginning of the period for which the headwater benefit assessment is to be determined in this proceeding.

COUNSEL: Mr. Examiner, we offer in evidence as items by reference each of these project licenses, as amended and supplemented.

Q. Please describe generally these four hydroelectric developments of licensee, Alabama Power Company.

[214]

A. Weiss Dam has a drainage area of approximately 5,273 square miles and is located on the Coosa River approximately

[214]

32 miles upstream from Gadsden, Alabama, and 130 miles below Allatoona. Licensee's construction of the project was begun in 1958 and completed in 1962. The project has a total installation of 87,750 kilowatts in three units of equal size. Two units were placed in commercial operation on June 5, 1961 with a total turbine capacity of about 18,000 cubic feet per second (cfs), and the third unit was placed in commercial operation on July 5, 1962. Total turbine capacity with three units is about 26,000 cfs.

The dam consists of a concrete gated spillway section with compacted-earth abutment dikes. A diversion canal from the dam is approximately 4 miles long, being constructed across a 20-mile bend of the river, with the power plant at the lower end of the canal. Weiss Reservoir contains a power pool with top elevation 564 feet above mean sea level (msl), containing approximately 306,000 acre feet of storage. The Storage Delineation Curve appearing as Appendix B, Chart No. 19, in the "Alabama-Coosa River Basin Reservoir Regulation Manual" issued by the Corps of Engineers applicable to Weiss Reservoir authorizes raising of the power pool to elevation 564 by May 1 each year and requires drawdown of the power pool to elevation 558 by December 31 each year.

Q. I show you a chart marked "Alabama Power Company Exhibit No. 4, Alabama-Coosa Basin Reservoir Regulation Manual, Weiss Reservoir Storage Delineation Curve, Appendix B, Chart No. 19" and ask you if this is the chart to which you refer?

[215]

A. It is. This Storage Delineation Curve also appears as Plate 3 of Staff Exhibit 1 for identification and was applicable to operations of Weiss Reservoir during the period 1961-1963.

COUNSEL: Mr. Examiner, we request that this exhibit as identified by Mr. Miller be marked for identification as Alabama Power Company Exhibit No. 4.

Q. I also show you two additional charts respectively marked "Alabama Power Company Exhibit No. 5, Flood-Control Regulation Schedule for Weiss Reservoir, Appendix B, Chart No. 20", and "Alabama Power Company Exhibit No. 6, Alabama-Coosa Basin Reservoir Regulation Manual, Weiss Reservoir Induced Surcharge Curve, Appendix B, Chart No. 21", and ask you if these charts were similarly issued by the Corps of Engineers and applicable to operations of Weiss Reservoir during the period 1961-1963. A. Yes, sir. Operating instructions on both of these charts were applicable during that period and provided for mode of operation of the Weiss Power Plant and spillways under various conditions of inflow and elevation.

COUNSEL: Mr. Examiner, we request that these exhibits identified by Mr. Miller be respectively marked for identification as Alabama Power Company Exhibit No. 5 and Alabama Power Company Exhibit No. 6.

Q. What is the storage in Weiss Reservoir above the Storage Delineation Curve? A. 148,000 acre feet between elevation 558 and elevation 564. An additional 301,000 acre feet of storage is available between elevations 564 and 572.

* * *

[220]

Q. Mr. Miller, what formula did you use to compute the payment to be made to the United States for energy gain benefits received from Allatoona by the licensee at its Weiss, Lay, Mitchell, and Jordan plants? A. I used the same formula utilized by the Staff in its computation of energy gain benefits in accordance with Section 11.27(b) of the Rules and Regulations of the Federal Power Commission, as follows:

$$P_n = C_p \frac{V_n}{V_f + V_d}$$

in which P_n = annual Payment to be made for headwater

benefits received at a downstream non-federal plant (or group of plants),

C_p = annual 10(f) costs of the Allatoona Dam and reservoir to be borne by power both at site and downstream,

V_n = net annual monetary value of benefits received at a downstream non-federal plant (or plants),

[221]

V_f = annual monetary value of the Federal headwater improvement to at-site power production, and

V_d = net annual monetary value of benefits received at all downstream plants.

Q. Based upon your review of the Staff's working papers and the Staff Report identified as Staff Exhibits 1 and 2, do you agree that the Staff has used proper and reasonable methodology in determination of energy gains or losses attributable to Allatoona regulation? A. No. Since actual or or "regulated flow energy" generated by licensee's plants downstream from the upstream, federally-owned storage project (Allatoona) is a matter of record during the period 1961-1963, a reasonable determination of energy gains or losses at licensee's plants, resulting from Allatoona operation, requires an estimate of what energy all of licensee's downstream plants would have produced if the upstream federally-owned storage project had not been constructed. After the latter is estimated, it is subtracted from the actual "regulated flow" energy to obtain the estimated gain or loss in energy attributable to the operation of the upstream federally-owned storage project. This procedure has not been followed by the Staff in this proceeding, and we have therefore undertaken independent studies, utilizing this basic methodology, to determine energy gains and losses in

kilowatt-hours based on simple aggregate changes in water level attributable to Allatoona.

Q. Has this basic methodology recently been used and approved in any headwater benefit proceedings to measure energy gains attributable to regulation of river flow by federally-owned upstream improvements?

[222]

A. Yes. The Staff used this methodology in the presentation of its cases in two recent headwater benefit assessment proceedings, *South Carolina Electric & Gas Company*, Docket No. E-6468, and *Virginia Electric & Power Company*, Docket No. E-6684. In each proceeding, the Federal Power Commission approved use of this methodology.

Q. As a result of application of this methodology in your independent studies, have you calculated the net gains in kilowatt hours at licensee's four plants attributable to Allatoona? A. Yes. My studies and computations indicate that apparent net gains in kilowatt-hours (Kwh) attributable to Allatoona, with adjustment for error in measurement attributable to evaporation, rainfall, groundwater storage and evapotranspiration, are as follows:

	1961	1962	1963	3-yr Total 1961-1963
Weiss	5,926,056	11,447,268	12,197,481	-
Lay	9,414,335	12,077,570	17,327,318	-
Mitchell	8,980,468	11,790,136	15,786,951	-
Jordan	11,880,608	14,871,264	22,794,318	-
Total Licensee (APCo.)	36,201,467	50,186,238	68,106,068	154,493,773 Kwh

Q. What do you mean by "apparent" net gains? A. My use of "apparent" energy gains is intended to indicate that the specified adjustment for error in measurement is not reflected in my calculations. For purposes of convenience, this error in measurement attributable to evaporation, rainfall, ground water storage and evapotranspiration will in my testimony be identified as "error in measurement."

[222]

Q. Will this error in measurement be established by another witness for licensee. A. Yes. Mr. D. L. McCrary, licensee's Assistant Manager of Engineering.

Q. Please describe generally the procedures used by you to calculate these apparent energy gains at licensee's Weiss, Lay, Mitchell and Jordan

[223]

projects during the period 1961-1963 attributable to Allatoona stream flow regulation. A. In order to determine these apparent energy gains at licensee's downstream plants (Weiss, Lay, Mitchell and Jordan), it was first necessary to determine the river flow available to these plants without Allatoona, that is, as if Allatoona did not exist during the period 1961-1963. In order to do this, the natural flow of the Coosa River into Weiss Reservoir was determined by adding quantities of water in day second feet (def) placed in storage at Allatoona to, or subtracting quantities of water (in def) taken from licensee's log sheets at Weiss on the day following the storage change at Allatoona. Log sheets applicable to inflows at Weiss one day later than storage changes at Allatoona were used to allow for the one day travel time for Allatoona storage releases to reach Weiss. Having determined the natural inflow into Weiss (inflow without Allatoona), it was then necessary to operate Weiss with that calculated natural inflow in accordance with applicable rules of the Corps of Engineers (Alabama Power Company Exhibits Nos. 4, 5, and 6 for identification) and to operate Lay, Mitchell and Jordan plants located downstream from Weiss in a manner consistent with such operations at Weiss. This was done as follows:

(A) Whenever Weiss Reservoir was above the Storage Delineation Curve shown on Alabama Power Company Exhibit No. 4 for identification (in Area B or above elevation 564 as shown on Plate 3, Staff Exhibit 1 for identification), Weiss was operated in accordance with regulations

[224]

of the Corps of Engineers fixing the quantities of water releases from Weiss for specific periods of time (Alabama Power Company Exhibits 5 and 6 for identification). Whenever calculated inflow to Weiss Reservoir (without Allatoona) caused the reservoir to rise above the Storage Delineation Curve, total discharge from Weiss Reservoir, as prescribed and required by applicable rules of the Corps of Engineers according to conditions of forebay elevation and concurrent rates of inflow, was assigned as appropriate to turbine discharge up to the maximum turbine capacity available at Weiss power plant at the time, with the remainder, if any, assigned to spillway gate discharge. In accordance with applicable rules of the Corps of Engineers, any amount of natural inflow into Weiss Reservoir in excess of this required total plant discharge (turbine and spillway) was placed in storage in Weiss Reservoir. This procedure was continued day by day using the natural flow (river flow without Allatoona) until elevation of Weiss Reservoir returned to the Storage Delineation Curve.

The travel time between Weiss and downstream plants Lay, Mitchell and Jordan is about two days. Whenever Weiss (without Allatoona) was operating above the Storage Delineation Curve, total plant discharges (without Allatoona) were determined at licensee's downstream plants Lay, Mitchell and Jordan by computing for anyone day the difference between total actual plant discharge at Weiss with Allatoona and total calculated discharge at Weiss without Allatoona, and adding this difference to or subtracting this difference from, as appropriate, actual recorded plant discharges (with Allatoona) at each of these

[225]

downstream plants two days later. This calculated total plant discharge at each plant was then assigned through the turbines at each plant up to maximum hydraulic capacity

[225]

available at the time, with the remaining plant discharge, if any, assigned over spillways.

(B) Whenever Weiss Reservoir was at or below such Storage Delineation Curve (in Area A on Plate 3, Staff Exhibit 1 for identification), Weiss was operated with the calculated natural inflow pursuant to Corps of Engineers' regulations specified in Alabama Power Company Exhibit No. 5 for identification so as to best suit licensee's system requirements. The operating decisions of licensee applicable to Weiss during this period were those deemed most reasonable with due consideration given to calculated natural flow levels, storages available in each of licensee's four plants, rainfall, stream gauge records, unit outages and the season of the year. Licensee's objective was to make a decision reasonably consistent with that which would have been made by an operating engineer at that moment of time based on all pertinent, available information; the ultimate purpose being to utilize Weiss storage available below Storage Delineation Curve to regulate natural flow at Weiss (without Allatoona) so as to make maximum use of water at licensee's downstream plants, enabling such plants to operate at best gate rather than at full gate or to prevent or reduce spillage. On a few occasions, pondage below the top of the power pool at Lay, Mitchell and Jordan was used to re-regulate inflows to permit use at a subsequent date when flows could be utilized to best advantage.

* * *

[274]

A. Yes. I reviewed the studies of Mr. D. L. McCrary, relating to error in measurement. Mr. McCrary will present testimony in this proceeding supporting such studies. I ascertained that the apparent energy gains attributable to Allatoona should be reduced to reflect this error in measurement, in 1961, by 2,625,569 Kwh, in 1962, by 1,796,014 Kwh and in 1963, by 2,150,284 Kwh. These corrections gave the following results:

Net Monetary Value of Energy Gains at Licensee's Weiss, Lay, Mitchell and Jordan Hydro Plants

(Corrected for error in measurement)

Year	Energy Gains	Net Monetary Value	
		(mills/Kwh)	(Dollars)
1961	33,575,898	1.924	64,600
1962	48,396,224	1.889	91,420
1963	65,755,784	1.946	128,350
Total	147,727,906		284,370

Q. Mr. Miller, you have previously identified the formula adopted to compute the headwater benefits payments in this proceeding. Which component in that formula represents the net monetary value of these energy gains at licensee's plants? A. The component, V_n. We propose for purposes of comparison to compute the headwater benefits payments for this period by substituting for the component, V_n, in this adopted formual both the total annual net value of apparent energy gains (uncorrected for error in measurement). $296,-988, and the total annual net value of energy gains (corrected for error in measurement), $284,370.

Q. Wher. did you derive the monetary quantities to be substituted for the other componenets in such formula?

A. The component, P_n, represents, of course, the annual payment to be made by the licensee.

The component, V_d, represents the net annual monetary value of benefits received at all downstream plants. Since the monetary quantities to be substituted for the component, V_n, represent net annual monetary value of benefits received at licensee's "group of plants", these same quantities are substituted for the component, V_d.

The component, C_p, represents annual 10(f) costs of the Allatoona Dam and reservoir to be borne by power both at site and downstream. The Staff, Secretary of the Interior and the licensee have stipulated for purposes of this proceeding that these annual costs (interest, depreciation and main-

[275]

tenance) are, for 1961, $584,347; for 1962, $585,629 and, for 1963, $592,756.

The component, V_f, represents the annual monetary value of the federal headwater improvement to at-site power production. The Staff states as its basic premise in computing this at-site value that this value is considered to be equal to the total annual power costs and that the components making up total annual power costs are the annual costs of specific power facilities and the annual costs of the joint-use facilities to be borne by power (page 16, Staff Exhibit No. 1 for identification). The Staff, however, utilizes only the annual costs on the joint-use facilities allocated to power as the value of the headwater improvement to at-site power (V_f in the formula). It is my opinion that this is unreasonable and results in a depressed, unrealistic monetary value for at-site power, thus improperly increasing licensee's headwater

[276]

benefits payments for this three year period. The component, V_f, should in my opinion properly include the annual costs of specific power facilities at Allatoona as well as annual costs on the joint-use facilities allocated to power. The net annual monetary value of energy gains received at licensee's plants is determined on the basis of the cost of alternative steam-electric generated energy which would be required if Allatoona did not exist. The net annual monetary value of power at Allatoona should be determined on the same basis, that is, as if Allatoona did not exist. If Allatoona ceased to exist, annual power values at Allatoona would be destroyed. Since cost equals value, we must determine annual power costs to determine annual value destroyed. Since annual power costs include costs of specific power facilities and joint-use facilities allocated to power, neither may be eliminated from the determination without understating annual power value at Allatoona.

Q. What calculations have you made to determine total

annual power costs? A. I first point out that licensee has joined in a stipulation with all parties to this proceeding in which the annual costs, including fixed charges and operation and maintenance costs applicable to the joint-use facilities allocated to power, have been established for purposes of this proceeding (paragraphs 5 and 6 of such stipulation), as follows:

Item	1961	1962	1963
Annual Fixed Charges	$583,154	$582,906	$583,344
Operation and Maintenance Costs	66,712	67,723	84,772

[277]

These annual costs total as follows:

1961 - $649,866
1962 - $650,629
1963 - $668,116

I calculated annual fixed charges of specific power facilities, using data obtained from Staff Exhibit 1 for identification, as follows:

Investment in Specific Power Facilities at Allatoona

1961	1962	1963
$9,266,682	$9,266,682	$9,266,682

(Staff Exhibit No. 1, page 14)

Annual Fixed Charges on Investment In Specific Power Facilities at Allatoona

	1961	1962	1963
Interest @ 2.50%	$231,667	$231,667	$231,667
Amortization @ 1.026%	95,076	95,076	95,076
Insurance @ .10%	9,267	9,267	9,267
Interim Replacements	4,800	4,800	4,800
	$340,810	$340,810	$340,810

(Percentages for Interest, Amortization, Insurance and the

amount for Interim Replacements are the same as used by the Staff for joint-use facilities allocated to power)

Having determined annual fixed charges on investment in specific power facilities, I then computed annual fixed charges on specific power facilities and joint-use facilities allocated to power as follows:

Annual Fixed Charges on Specific Power Facilities and on Joint-Use Facilities Allocated to Power.

	1961	1962	1963
Annual Fixed Charges-Specific Power Facilities	$340,810	$340,810	$340,810
Annual Fixed Charges-Joint-Use Facilities Allocated to Power	583,154	582,906	583,344
Annual Fixed Charges	$923,964	$923,716	$924,154

I then determined total operating and maintenance expenses, including those on specific power facilities and those on non-specific (joint) facilities. Such amounts are shown on Tables 14, 15 & 16 of Staff Exhibit 1 for identification for 1961, 1962, and 1963, respectively, under description "Operating Costs - Total Electric Generation" and "Maintenance Cost - Total Generation Maintenance", respectively.

	1961	1962	1963
Operation	$157,189	$132,249	$135,526
Maintenance	57,042	92,666	79.930
Annual Cost of operation & maintenance	$214,231	$224,915	$215,456

I then determined total annual power costs of the federal headwater improvement, as follows:

	1961	1962	1963
Annual Fixed Charges	$ 923,964	$ 923,716	$ 924,154
Annual Cost of Operation & Maintenance	214,231	224,915	215,456

Total Annual Power Costs	$1,138,195	$1,148,631	$1,139,610

Q. Do you also consider it appropriate for purposes of comparison to compute the headwater benefits payments for 1961, 1962 and 1963 by substituting different monetary values for the component, V_f, in the formula? A. Yes. For comparison, we propose to substitute the monetary value of at-site power utilized by the Staff in its studies ($649,866 for 1961, $650,629 for 1962 and $668,116 for 1963) and the higher at-site power values which we consider to be reasonable ($1,138,195 for 1961, $1,148,631 for 1962 and $1,139,610 for 1963).

Q. Please summarize the relationships of these monetary quantities to the formula components and use the adopted formula to compute the headwater benefits payments on each basis which you have selected for comparison.

[279]

A. My summaries and computations are as follows:

(1) Based on apparent energy gains, V_f reduced to elimate annual costs of specific power facilities

Components	1961	1962	1963
C_p	$584,347	$585,629	$592,756
V_n	69,652	94,802	132,534
V_f	649,866	650,629	668,116
V_d	69,652	94,802	132,534

Payment for 1961:

$$P_n = (584{,}347)\ \frac{69{,}652}{649{,}866 + 69{,}652} = \$\ 56{,}566$$

Payment for 1962:

$$P_n = (585{,}629)\ \frac{94{,}802}{650{,}629 + 94{,}802} = \$\ 74{,}479$$

Payment for 1963:

$$P_n = (592{,}756)\ \frac{132{,}534}{668{,}116 + 132{,}534} = \$\ 98{,}121$$

Total payment for 1961-63 $229,166

[279]

(2) Based on apparent energy gains corrected for error in measurement, V_f reduced to eliminate annual costs of specific power facilities.

Components	1961	1962	1963
C_p	$584,347	$585,629	$592,756
V_n	64,600	91,420	128,350
V_f	649,866	650,629	668,116
V_d	64,600	91,420	128,350

Payment for 1961:

$$P_n = (584{,}347)\ \frac{64{,}600}{649{,}866 + 64{,}600} = \$\ 52{,}835$$

Payment for 1962:

$$P_n = (585{,}629)\ \frac{91{,}420}{650{,}629 + 91{,}420} = \$\ 72{,}149$$

Payment for 1963:

$$P_n = (592{,}756)\ \frac{128{,}350}{668{,}116 + 128{,}350} = \$\ 95{,}522$$

Total payment for 1961-63 $220,506

[280]

(3) Based on apparent energy gains, V_f including annual costs of specific power facilities.

Components	1961	1962	1963
C_p	$ 584,347	$ 585,629	$ 592,756
V_n	69,652	94,802	132,534
V_f	1,138,195	1,148,631	1,139,610
V_d	69,652	94,805	132,534

Payment for 1961:

$$P_n = (584{,}347)\ \frac{69{,}652}{1{,}138{,}195 + 69{,}652} = \$33{,}697$$

Payment for 1962:

$$P_n = (585{,}629)\ \frac{94{,}802}{1{,}148{,}631 + 94{,}802} = \$44{,}650$$

Payment for 1963:

$$P_n = (592{,}756)\ \frac{132{,}534}{1{,}139{,}610 + 132{,}534} = \$61{,}754$$

Total payment for 1961-1963 $140,101

(4) Based on apparent energy gains corrected for error in measurement, V_f including annual costs of specific power facilities.

Components	1961	1962	1963
C_p	$ 584,347	$ 585,629	$ 592,756
V_n	64,600	91,420	128,350
V_f	1,138,195	1,148,631	1,139,610
V_d	64,600	91,420	128,350

Payment for 1961:

$$P_n = (584{,}347)\ \frac{64{,}600}{1{,}138{,}195 + 64{,}600} = \$\ 31{,}384$$

Payment for 1962:

$$P_n = (585{,}629)\ \frac{91{,}420}{1{,}148{,}631 + 91{,}420} = \$\ 43{,}174$$

Payment for 1963:

$$P_n = (592{,}756)\ \frac{128{,}350}{1{,}139{,}610 + 128{,}350} = \$\ 60{,}002$$

Total payment for 1961-63 $134,560

Q. Do you consider that 134,560 is a reasonable apportionment of Allatoona annual costs [10(f) costs] to the licensee's Weiss, Lay, Mitchell and Jordan Plants for this three year period?

[281]

A. Yes, I do.

Q. Mr. Miller, do you consider that your method of calculating this payment is engineeringly sound and reasonable?
A. Yes, I do.

Q. The Staff concludes in paragraph IX of its report (Staff Exhibits 1 and 2 for identification) that licensee's Coosa River hydroelectric plants involved in this proceeding would be fully dependable on the load in 1961, 1962 and 1963 during low and high flow periods, with or without regulation by Allatoona Reservoir, and that, therefore, there were no capacity benefits at these plants during these years. Do you concur with the Staff's conclusion in that regard?
A. Yes. Alabama Power Company received no capacity

[281]

from Southeastern Power Administration in 1961-1962-1963 and placed no orders with Southeastern Power Administration for water flow or capacity in those years. It is significant that licensee has never received from Wouth-eastern Power Administration, directly or indirectly, any assurance of scheduled storage releases at Allatoona.

Q. Mr. Miller, you have previously stated that you have reviewed the Staff's working papers and the Staff Report identified as Staff Exhibits 1 and 2. Based upon your analysis of the Staff's method of determining the headwater benefits payment in this case, do you have a general understanding of the procedures utilized by the Staff in its studies and calculations? A. Yes, I do.

Q. You have previously indicated that you consider the result determined by the Staff to be unreasonable because the Staff has not in your opinion used proper and reasonable methodology in determining energy gains or losses at the licensee's plants attributable to Allatoona.

[282]

Please state why you consider the procedures used by the Staff to be unreasonable. A. The Staff's determination of energy gains attributable to Allatoona during this period is unreasonable for a number of reasons.

The Staff fails to utilize natural Coosa River flows (without Allatoona) to calculate the amount of energy which would have been generated furing this three year period at all of the licensee's four plants, utilizing Weiss storage and regulation and the increments of storage available in Lay, Mitchell and Jordan plants. The Staff actually uses a methodology to estimate energy gains or losses at Weiss which is different from that used for Lay, Mitchell and Jordan.

With respect to Weiss, the Staff determined energy gains at that storage plant on a "with and without Allatoona" basis only when Weiss Reservoir elevation was not above the Storage Delineation Curve. Whenever the assumed conditions would cause Weiss elevation to rise above the Stor-

age Delineation Curve, or Weiss was above such curve, the Staff eliminated any consideration of benefits either positive or negative at Weiss. The stated reason is included on page 2 of Staff Exhibit 2 for identification as follows:

> "Positive energy benefits to Allatoona and negative energy benefits to Weiss are not credited when the Weiss pool is operating above the rule curve of Area A. This criterion was adopted because, with Weiss pool above Area A, outflow is in accordance with flood control operations as prescribed in the Weiss Reservoir Regulation Manual prepared by the District Engineer, U.S. Army Engineer District, Mobile, Alabama, The operations prescribed by the Corps require the outflow from the reservoir, when the pool is in Area B (see Plate 3), to be equal to the maximum hydraulic capacity of the three turbines, whether the generating units are
>
> [283]
>
> in use or not, so as to lower the pool to rule-curve elevation, if possible, by this operation. Should the pool rise above maximum power pool elevation 564, ourflow is to be increased in accordance with rules prescribed in the manual. (See Plate 3, operating instructions.) Table 6 shows a typical energy gains computation for the Weiss plant."

We have heretofore established in the analysis of licensee's Exhibit No. 9 for identification that storage does exist in Weiss Reservoir above the Storage Delineation Curve and that water stored in Weiss Reservoir above such Delineation Curve does result in generation increases at Weiss and also at downstream plants when Weiss is operated in accordance with flood control regulations prescribed in the Weiss Reservoir Regulation Manual, prepared by the District Engineer, U. S. Army Engineer District, Mobile, Alabama (Alabama Power Company Exhibits No. 5 and 6 for identification). The Staff's failure to recognize this fact causes the Staff's

[283]

computations of net energy gains to be both unrealistic and unreasonable.

It is significant the Allatoona Reservoir is also operated under the terms of the Reservoir Regulation Manual prepared by the District Engineer, U. S. Army Engineer District, Mobile, Alabama, and that such regulation manual is entitled "Alabama - Coosa Basin Reservoir Regulation Manual, Appendix A". Chart No. 11 and Charts 12 and 13 of such Appendix A applicable to Allatoona Reservoir establish flood control zones and operating rules applicable thereto.

Q. Mr. Miller, I hand you three charts, respectively marked "Alabama Power Company Exhibit No. 18, Alabama-Coosa Basin Reservoir Regulation

[284]

Manual, Allatoona Reservoir, Etowah River, Ga., Flood-Control Zones and Operating Rules, Appendix A, Chart No. 11". "Alabama Power Company Exhibit No. 19, Normal Flood-Control Regulation Schedule for Allatoona Reservoir, Appendix A, Chart No. 12", and "Alabama Power Company Exhibt No 20, Emergency Flood-Control Regulation Schedule for Allatoona Reservoir, Appendix A, Chart No. 13", and ask you if these are the charts to which you refer? A. They are. These charts were taken directly from a Reservoir Regulation Manual furnished me by the Corps of Engineers, Mobile District.

COUNSEL: Mr. Examiner, we request that these charts as identified by Mr. Miller be respectively marked for identification as Alabama Power Company Exhibit No. 18, Alabama Power Company Exhibit No. 19 and Alabama Power Company Exhibit No. 20.

Q. Have you prepared another exhibit which relates to Allatoona operations during periods of high flow in the years 1961, 1962 and 1963? A. Yes, Plate 4 of Staff Exhibit No. 1 for identification contains power guide curve and pool elevations for Allatoona during this three year

period. The exhibit prepared under my supervision is a copy of this Plate 4 with the top of power pool shown in red.

Q. I hand you a chart marked "Alabama Power Company Exhibit No. 21, Allatoona Reservoir, Power Guide Curve and Pool Elevations" and ask if this is the exhibit to which you refer? A. Yes, it is.

COUNSEL: Mr. Examiner, we request that the chart as identified by Mr. Miller be marked for identification as Alabama Power Company Exhibit No. 21.

[285]

Q. Do you consider that these Exhibits Nos. 18, 19, 20 and 21 support your conclusion that the Staff's method of computing energy gains or losses is unreasonable? A. Yes, I do. It can be seen on Exhibit No. 21 for identification that for a substantial portion of the 1961, 1962, 1963 period, Allatoona operated above the top of the power pool and, therefore, in flood control zones. An inspection of Table 1 of Staff Exhibit No. 1 for identification shows in Column 5 that during the month of May, 1963, Allatoona Reservoir elevation was above the top of the power pool, and therefore in the flood control zone, on all except five days (May 24 - May 28, inclusive). The Staff found that 46% of the benefits attributable to Allatoona in the year 1963 occurred in May. It is therefore clear that such benefits resulted almost entirely from Allatoona operations in flood control zones where the reservoir, according to Chart 11, licensee's Exhibit No. 18 for identification". . . .will be operated primarily for flood control when pool is above the top of power pool. . . ." The note or paragraph at the bottom of said Chart 11 is particularly significant since it requires that where ". . . releases cannot be made through turbines, the full required release will be maintained through the flood control sluices and/or spillways." This requirement is substantially similar to the Corps of Engineers' flood-control regulation relating to "Required Outflow" at

[285]

licensee's Weiss plant (footnote (1) of Alabama Power Company Exhibit No. 5 for ifentification) which in turn appears to be the Staff's basis for eliminating positive or negative benefits at Weiss when Weiss reservoir was above the

[286]

Storage Delineation Curve. It is patently unreasonable to charge the licensee for substantial benefits attributable to Allatoona when Allatoona operates in its flood control zone, while denying that licensee's Weiss Dam and reservoir have similar capability and provide similar results.

The Staff does not properly determine energy gains or losses at downstream plants Lay, Mitchell and Jordan. Prior to Weiss operation, the Staff's method of calculating gains at these plants is based on Coosa River flows "with and without Allatoona", although it must be noted that application of this basic methodology includes some errors. Subsequent to Weiss operation, however, the Staff ignores Weiss project, a substantial storage plant, and makes its calculations "with and without Allatoona" only after removal of Weiss from the river. The end result of this procedure is to deny to licensee, Alabama Power Company, the full use of storage in Weiss Reservoir for regulation of Coosa River flows without Allatoona at these downstream plants. This is patently unreasonable, as Weiss is one of licensee's "group of plants."

At downstream plants Lay, Mitchell and Jordan, the Staff also erred in its failure to recognize pondage available in such plants to utilize and re-regulate flows without Allatoona to produce maximum gains. This occurs although the Staff describes in its Exhibit No. 1 for identification sizable quantities of storage available at such plants. The Staff also applies incorrect conversion factors, "K" factors, at times when converting turbine flow changes to generation changes. The method used by the Staff, while simple on its face, results in an improper determination since the conversion

* * *

[380]

BY MR. LEVANT:

Q. Mr. Miller, turning to page 65 of your testimony, about halfway down the page you state "The component, V_f, represents the annual monetary value of the federal headwater improvement to at-site power production." Is that correct? Is that your statement? A. I am still thinking, if you don't mind, Mr. Levant. I will respond just as soon as I am ready.

That is what my testimony says, yes, sir.

Q. Now, is it not true that that sentence has two components: Namely, annual monetary value of the federal headwater improvement, one; and at-site power production as two? A. I don't see any punctuation at all in the sentence, and I believe for it to be complete you will have to read it in a body.

Q. No, I am not asking you about punctuation. I am asking you whether the literal meaning of the sentence contains two components, one being annual monetary value of the federal headwater improvement, and two, at-site power production. These would be two separate items, would they not? A. The sentence is a complete unit and as read by me, and is in my testimony as such. And I used it off of page 6 of Staff Exhibit No. 1 where it says, quote, "V_f is equal to

[381]

the annual—"

MR. LEVANT: Your Honor, this is not being responsive to my question. I think I asked a very simple question.

PRESIDING EXAMINER: State your question again, please.

BY MR. LEVANT:

Q. In the sentence "The component, V_f, represents the annual monetary value of the federal headwater improvement to at-site power production." My question was, does this sentence not contain two components, namely, one,

[381]

annual monetary value of the federal headwater improvement, and two, at-site power production? A. It is one element, V_f. It so states.

Q. That wasn't my question. I asked you whether the following terms or words make up two separate items, and the first one was "annual monetary value of the federal headwater improvement," that's one item; the second item is "at-site power production." These are two separate items, two different items, are they not? A. I don't see how it can be considered two separate items. It is all in context there, sir.

Q. Do these two items mean the same? Are they the same? A. No, they represent V_f.

Q. I am not asking you what V_f represents. I am asking whether there are two separate terms mentioned in this sentence:

[382]

One, the annual monetary value of the federal headwater improvement, and two, at-site power production.

Aren't these two separate– A. There are 17 different words or symbols in that sentence, and the sentence to me reads just exactly what it says: V_f represents the annual monetary value of the federal headwater improvement to at-site power production.

MR. LEVANT: You Honor, I believe the answer to this question is quite simple, and I believe that the witness is not being responsive.

PRESIDING EXAMINER: I think you can state yes or no, and then if you have to explain, why, you certainly can.

MR. VOGTLE: Your Honor, maybe he doesn't understand the question.

MR. LEVANT: Well, the witness hasn't said that.

PRESIDING EXAMINER: Do you want the question again?

THE WITNESS: Mr. Levant, they may mean so to you,

but I can't agree that to me they would mean anything more than a package on that piece of paper.

BY MR. LEVANT:

Q. Well, are you saying, then, that at-site power production means annual monetary value of the federal headwater improvement? Is that what you are saying? A. No, sir. I am saying the–

[383]

Q. Then they mean something different? A. The annual monetary value of the federal headwater improvement to at-site power production represents V_f. Those are your words. I took them out of your exhibit.

Q. I am asking you a very simple question, Mr. Miller, and you are not responding. A. Well, I'm trying to, Mr. Levant.

MR. GATCHELL: I suggest, Mr. Examiner, he has responded. Mr. Levant doesn't want that answer.

He ought to go on to his next question.

PRESIDING EXAMINER: This is cross-examination. If counsel doesn't understand it, he can ask him.

You may continue your inquiry.

BY MR. LEVANT:

Q. What does the term "at-site power production" denote to you, Mr. Miller?

THE WITNESS: May I have the question reread, please?

PRESIDING EXAMINER: Certainly.

(Question read.)

THE WITNESS: In the context in which it is used in that sentence it means to me this: It is the value of all–

MR. LEVANT: No, your Honor–

THE WITNESS: Excuse me. I didn't mean to say "value."

MR. LEVANT: The witness is–

THE WITNESS: I withdraw the word "value," and I beg your

[384]

pardon.

MR. LEVANT: I asked a simple question, and I want a simple answer to it.

PRESIDING EXAMINER: You want to know what it means to him.

MR. LEVANT: That's right.

PRESIDING EXAMINER: It may mean a lot different than you think it means, so let's find out what it means to this witness, regardless.

MR. LEVANT: All right.

PRESIDING EXAMINER: That is what we are trying to find out, what does it mean to you?

THE WITNESS: I am afraid I lost the page in my testimony I was on. Can someone refer me to it?

MR. GATCHELL: Page 65.

MR. LEVANT: Your Honor, I would like to withdraw that question, if I may–

PRESIDING EXAMINER: You may; it is your question.

MR. LEVANT: And rephrase it.

BY MR. LEVANT:

Q. What does the term "at-site power production" mean?

A. Total annual power production at Allatoona.

Q. Now, in evaluating the total power production at Allatoona, would we not utilize the specific facilities at Allatoona, that is, the generating facilities, plus the

[385]

joint-use facilities, namely, the dam and reservoir? A. You are asking me how I did it?

Q. No.

MR. LEVANT: Would you read the question, please.

(Question read.)

THE WITNESS: This is in determining V_f?

BY MR. LEVANT:

Q. No. This is in determining the value of the power production at Allatoona. A. Well, the value–if I under-

stant it, the value of the power production at Allatoona presumably is what you sell it for. But somewhere along the line that has been equated to costs associated with Allatoona, and I would say that it should include the—to equivalate to the value, it should include the costs of the specific power facilities at Allatoona as well as the costs on the joint-use facilities allocated to power, yes, sir.

Q. Now, I would like to refer you to page 16 of Staff Exhibit No. 1. A. I should point out that I don't have available a copy of Staff Exhibit No. 1. All I have is a master copy that has been corrected.

MR. VAGTLE: I can give him this one. And the addendum is behind that.

(Document handed to the Witness by Mr. Vogtle.)

[386]

BY MR. LEVANT:

Q. Now, under the Roman Numeral XIII—

PRESIDING EXAMINER: On page 15?

MR. LEVANT: On page 16, your Honor, at the bottom.

BY MR. LEVANT:

Q. (continuing)—is stated as follows: "The annual value to the United States of the at-site power produced at the Allatoona project is considered to be equal to the total annual power costs. The components making up the total annual power costs are the annual costs of specific power facilities and the annual costs of the joint-use facilities to be borne by power."

The two components which are mentioned here, namely annual costs of specific power facilities and the annual costs of the joint-use facilities are the same two components to which we have just referred, is that not so—to which you referred in your answer? A. Yes, I think I used some of that same terminology on page 65 of my testimony. "Components making up total annual power costs are the annual costs of specific power facilities and the annual costs of the joint-use facilities to be borne by power." That's correct.

[386]

Q. Right. And since power from Allatoona is sold at cost, therefore the cost is tantamount to the value of the power?

[387]

A. That is the usual.

Q. Right.

Now, at page 66, at the bottom of the page in your last answer you describe the costs applicable to the joint-use facilities allocate to power. A. I think that was stipulated, yes, sir.

Q. Right. And that was stipulated. And on page 67 you give the costs for each year: $649,866 for '61; $650,629 for '62; and $668,116 for 1963. Now, those are the annual costs for the joint-use facilities allocated to power.

Now, you subsequently in your testimony compute the annual costs of the specific power facilities, do you not? A. Yes, sir.

Q. And when you add the costs of the joint-use facilities and the specific power facilities, you arrive at the costs of the power produced at Allatoona; is that right? Those two components make up the costs of the power produced at Allatoona? Is that true? A. Well, I didn't to it quite that way. And I think you can read my testimony and determine precisely how I did it.

Q. You took the joint-use costs, the costs of the joint-use facilities allocated to power which we referred to— A. Yes.

Q. And— A. Just a moment. I merely detailed them on that page.

[388]

Q. Well, but in essence that is what you did: You took the annual costs of these two components, you added them together, and this gave you the cost of power at Allatoona. A. No, sir, that is not what I did.

Q. Well, you did it the other way around. You said "Having determined annual fixed charges on the investment in specific power facilities, I then computed the annual fixed charges on specific power facilities and joint-use facilities allocated to power." Is that not so? A. Yes, sir.

Q. I was just reading from your testimony. A. That's correct, fixed charges. That is on page 67 of my testimony.

Q. I see. You took the fixed charges and then you took the O&M, the operation and maintenance, and then combined the two? A. I combined the fixed charges because I had no way of knowing what they were. I had to compute them.

Q. Right, but ultimately— A. But as a matter of fact, the operating and maintenance costs—"operation costs—total electric generation," and "maintenance cost—total generation maintenance," I assume according to the Staff exhibit come out in a bulk and include both specific and joint-use allocated to power. Therefore, I saw no need to add anything together. What you-all did was

[389]

reduce those.

Q. No. A. I say the right approach is to leave them in. That is what they should be.

Q. Now ultimately what you came up with was a cost for power production at Allatoona— A. Total.

Q. —which included the costs total; which included the costs for the specific facilities, the generator and the dam and the reservoir? A. Yes. That is on page 68 of my testimony.

Q. Right.

Now, Staff did not compute the total cost of at-site power production at Allatoona, did it? A. No, sir, it went to some lengths to eliminate the annual costs associated with specific power facilities. It had to make an extra computation to do so.

[389]

Q. No, I asked you a simple question,– A. Well, you got a simple answer.

Q. –Mr. Miller. Staff did not compute the total cost of at-site power production at Allatoona? A. No.

Q. And you computed it? A. That's correct.

Q. Would you just for clarity here define, Mr. Miller,

[390]

what we mean by specific power facilities as we have referred to them. I think I have mentioned generator. Does it include any other? A. Specific power facilities include the power house and equipment, power intake works, tailrace, and the switchyard structures and equipment represented by the investment costs at Allatoona of $9,266,682 for the year 1961, 1962 and 1963 as shown on Staff Exhibit No. 1, page 14.

Q. Now, you refer–I think I called your attention to the joint-use facilities and we found those figures on 67, the top of page 67.

Now, I notice the same figures on page 68 in the last complete answer that you give there. Those are the same figures, are they not? A. I certainly hope they are. They are intended to be. They look like they are. 649,866 is the same as 649,866. Yes, they're the same figures.

Q. Now, in other words, on page 66 of your testimony you refer to those figures as the cost of joint-use facilities allocated to power, but yet when you get over to page 68 you define these same figures as monetary value–I quote: "monetary value of at-site power utilized by Staff."

Now, you have apparently used two different terms to identify these same figures. A. Not at all, Mr. Levant. All I said in this–

[391]

Q. Did you not use two different terms here to describe the same figures? A. No. I used the words "monetary value of at-site power utilized by the Staff in its studies."

Q. Fine. A. And that's what the Staff used. And when qualified with those words—

Q. No— A. —that is what those numbers mean.

Q. Mr. Miller, you said "I want to substitute the monetary value of at-site power utilized by staff." Now, Staff used those figures to represent joint-use facilities allocated to power, which everyone has stipulated to. Now isn't there some question here in your mind as to why there should be two different references to the same numbers?

MR. VOGTLE: The stipulation being brought into it, your Honor, it will speak for itself. And I believe if the witness has to be examined about the stipulation, he ought to have a copy of it.

MR. LEVANT: Fine.

I think he made the reference to the stipulation. I think it appears right here in his testimony on page 66. However, if he would like to look at a copy, I have one here.

THE WITNESS: Mr. Levant, if you will look at Exhibit No. 1, page 16, last line, which is the Staff's exhibit—the

[392]

last sentence, actually, starting with the word "Hence": "Hence, the total annual costs consisting of the annual fixed charges and the operation and maintenance costs on the joint-use facilities allocated to power represent the value of the headwater improvement to at-site power to be used in the formula."

BY MR. LEVANT:

Q. Exactly, Exactly.

If you now go back to page 65 and read the sentence—and I quote: "The component, V_f, represents the annual monetary value of the federal headwater improvement to at-site power production." Staff stated here that it used the annual fixed charges and the operation and maintenance costs on the joint-use facilities allocated to power to represent the value of the headwater improvement, which is the first component of this sentence, is it not? A. Well, it is

[392]

the number 649,866. I don't think we are arguing about any difference here. I don't see any difference.

Q. Well, let me simplify it for you, Mr. Miller.

Assuming that the term "annual monetary value of the federal headwater improvement" is "A", and the term "at-site power production is "B", then the sentence might read "The component, V_f, represents A to B," or if we were to substitute what staff has on page 16, the annual fixed charges and the

[393]

operation and maintenance costs on the joint-use facilities allocated to power represent the value of the headwater improvement, this would be "A". And "B" would represent the value of the at-site power production which we discussed just a moment ago and which you agreed included—

MR. VOGTLE: Your Honor, let me object, if I may. He is arguing with the witness, and he has for the pat half hour.

PRESIDING EXAMINER: Let's let him finish this question.

MR. VAGTLE: All right, sir.

MR. LEVANT: I was going to add an "Is it not?" to the end of that.

MR. VOGTLE: Now may I register my objection, please, sir.

PRESIDING EXAMINER: Objection is overruled.

BY MR. LEVANT:

Q. Therefore, "A", the total costs of the joint-use facilities, would be to "B", the at-site power costs, which you indicated were comprised of the costs of specific power facilities and the costs of the joint-use facilities. So therefore, with reference to your statement, and I quote, "The Staff, however, utilizes only the annual costs on the joint-use facilities allocated to power"—

MR. GATCHELL: Excuse me. What page is that, please?

MR. LEVANT: Sixty-five.

BY MR. LEVANT:

Q. Let me rephrase my question.

[394]

Is it not so that Staff utilizes the annual costs on the joint-use facilities allocated to power as the value of the headwater improvement as the "A" component of this sentence, and the the "B" component is never computed by Staff at all? Is this not so? A. You want me to respond?

Q. Yes. A. Well, I'm afraid I could never do so. The question was a little lengthy for me.

But in looking at page 65—I believe we can bring this thing to an end. I said on that page in the fourth or fifth line from the bottom that it utilizes only the annual costs on the joint-use facilities allocated to power as the value of the headwater improvement to at-site power.

Now apparently on page 68 in the last sentence I said, "For comparison, we propose to substitute the monetary value of at-site power utilized by the Staff," and you seem to be having some trouble with that.

Would it help if I changed the word "of" to the word "to"?

Q. Well, I think that that word "to" is crucial in the sentence on page 65, the sentence, "The component, V_f, represents the annual monetary value of federal headwater improvement to at-site power production." A. I don't deny that is what the Staff said. That is what they say in their Exhibit 1 on the bottom of page 16 and

[395]

the top of 17.

Q. Isn't it a fact the only facilities that would provide benefits to at-site power as well as downstream power production are the joint-use facilities? A. Well, your reasoning is a little bit beyond me, Mr. Levant. But I have—

Q. Well, isn't that your— A. I have in my testimony taken the same approach you took to me.

[395]

PRESIDEING EXAMINER: Wait a minute. One at a time. I can't get it, the reporter can't get it, and we are just wasting time.

Now let's start over again. Question?

BY MR. LEVANT:

Q. Is it not so, Mr. Miller, that only the joint-use facilities provide benefits to at-site power production as well as downstream power production? A. That portion of the joint-use facilities allocated to power?

Q. That's right. A. Yes, I think that is a correct statement.

Q. And isn't it a fact that the specific power facilities which you have described do not provide benefits either at-site or downstream as in the case of the joint-use facilities?

[396]

A. No, sir, they provide benefits at-site, substantial benefits at-site which are destroyed, in my opinion, if Allatoona did not exist during those three years in this period, and I think that is the rational basis on which to approach Allatoona just as you approach us.

PRESIDING EXAMINER: Just a minute. You say what was destroyed?

THE WITNESS: Well, we made our studies on the basis to determine our gains on the basis of removing Allatoona from the stream.

PRESIDING EXAMINER: I understand that, but you said that something was destroyed. I didn't quite get that.

THE WITNESS: Well, if you were to apply that same test to Allatoona, remove it from the stream—

PRESIDING EXAMINER: All right.

THE WITNESS: Then the power value is comprised of the specific power facilities at-site, and those non-specific facilities allocated to power at-site are effectively reduced to zero.

When it says cost is equal to value, then you have a cost

continuing and a value gone, and that is the value that I say should be in the V_f in this formula.

PRESIDING EXAMINER: Right here I think would be appropriate: You say joint-use facilities. One is power, the other is what? Flood-control is one?

THE WITNESS: Everything, yes, sir.

[397]

PRESIDING EXAMINER: Navigation is another one?

THE WITNESS: Navigation, recreation. I think it is described in the Staff exhibit. I was trying to get it specific.

PRESIDING EXAMINER: That is all right, if it is in the exhibit. And you concur with it, I presume?

THE WITNESS: Yes, I think I do.

PRESIDING EXAMINER: Very well.

* * *

[442]

MR. BELL: I call Mr. Elbert M. Rucker, please.

Whereupon,

ELBERT M. RUCKER

was called as a witness, and having been previously duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

* * *

[485]

TESTIMONY OF ELBERT M. RUCKER
WITNESS FOR THE SECRETARY OF THE INTERIOR

Q. Please state your name and address. A. Elbert M. Rucker, Route 6, Elberton, Georgia.

Q. By whom are you employed and what position do you hold? A. I am employed by the Southeastern Power Administration, Elberton, Georgia, and am Supervisory General Engineer in its Division of Power Operations.

* * *

[501]

Q. Mr. Rucker, what efforts have you made as far as the determination of energy gains at the Company's downstream plants due to Allatoona regulation is concerned? A. I have thoroughly reviewed the energy gain studies made by the Staff, as well as the principles upon which the studies were predicated. I find the Staff determination both straightforward and appropriate. I have also spotchecked the Staff's work under various water conditions. I accept the Staff figure of 193,324,333 kwh of net energy gains for the period 1961-63 as a reasonable and fair figure; however, I do not agree with the conclusion the Staff reached with respect to the value of these energy gains. I disagree with the method under which the unit value of these gains was determined.

* * *

[507]

Q. What would be the resulting assessment to Alabama Power Company for these benefits? A. In my opinion all of the power gains I have estimated should go into the assessment formula in determining the payment by Alabama Power Company. The assessment formula used is as follows:

$$P = C \frac{V_1}{V_2 + V_1}\text{; where}$$

P = Annual payment to be made by Alabama Power Company

C = Annual 10(f) costs of Allatoona Project

V_1 = Net annual monetary value of power gains

V_2 = Annaul monetary value of Allatoona to at-site power production

As shown on Exhibit No.   , the proposed assessment for 1961 is $114,360; for 1962, $168,475; and for 1963, $191,393. The resulting total assessment is $474,228.

[509]

Whereupon,

ELBERT M. RUCKER

resumed the stand and, having been previously duly sworn, was examined and testified further as follows:

CROSS-EXAMINATION

BY MR. VOGTLE:

* * *

[518]

are operated.

Q. That is with the Corps of Engineers? A. With the Corps of Engineers.

Q. So the answer I would assume to the question is that the company's responsibility terminated with the 1957 contract. A. I believe that is correct.

Q. In that same sentence, in the middle of page 8, am I correct that the reference is the Georgia Power Company, by "company"? The contract authorized the "company"? A. It is true the contract authorized the company to do this. However, it was prepared by Southern Services.

Q. Is this the Georgia Power Company, was the question? A. It is the Georgia Power Company. That is whom the contract was with.

Q. You refer to the 1957 contract and the June 19, 1962, supplemental contract which respectively regarded the output at Allatoona, Buford and Clark Hill and subsequently Hartwell and George—Alabama Power Company has never been a party to any of these contracts, to you knowledge, has it? I mean by "party", a signatory. A. No.

Q. Would you please state for the court where these five plants which I have named in the preceeding question are located: Allatoona, Buford, Clark Hill, Hartwell and George.

* * *

[754] Q. Please state your name.

[758] A. J. H. Miller, Jr.

data in Exhibit No. 29, it is my opinion that a reasonable charge to be borne by the licensee as the cost of the Staff's studies made for the purpose of estimating annual headwater benefit charges in this proceeding is $13,750. This amount represents the result of decreasing $18,724 by the 34% overhead charges indicated for the office of General Counsel and Federal Power Commission.

Q. Mr. Miller, both Mr. Hay and Mr. Rothberg testified as witnesses for the Staff in this proceeding and each stated his opinion as to the purpose of the Corps of Engineers' Instructions relating to flood control at the licensee's Weiss Dam. Mr. Hay states at page 50 of the transcript that "... The purpose of the Corps' instructions is to lower the surface of the Weiss reservoir to rule-curve elevation as quickly as reasonably feasible; hence, an operation at Allatoona which would prolong the attainment of this objective has not been counted as a benefit." Mr. Rothberg testified on page 111 of the transcript that ". . . The instructions in the manual require that the surface of Weiss reservoir be lowered to Area A as quickly as reasonably possible. With this requirement, the attainment of this objective precludes the assumption that credit should be given to Weiss for its ability to store additional water above Area A from daily Allatoona storage regulation." Do you agree with these Staff witnesses' interpretation of the Corps' rules applicable to flood control at Weiss reservoir and with

[759]

their use of that interpretation to foreclose use of Weiss storage above Area A? A. No, I certainly do not. While these witnesses for the Staff have ambiguously qualified the time period within which they interpret the rules to require a return of the Weiss reservoir surface to Area A with phrases "as quickly as reasonably feasible" and "as quickly as reasonably possible", it is apparent that each of these witnesses would have the Examiner and Commission conclude that a

substantial portion of the storage capability existing and used by the licensee for generation of electricity at Weiss reservoir should not be recognized for purposes of computing negative benefits in this proceeding because to do so would run counter to some alleged Corps of Engineers' restriction which operates during floods to prohibit or prevent the licensee's use of this storage for generation of electricity on days other than the day the water, if not stored at Allatoona, would have arrived at Weiss. In fact, this "quick return" interpretation is the basis for the Staff's assumption in its calculations, to licensee's detriment, that water withheld at Allatoona when Weiss reservoir surface is above Area A is not usable at Weiss for purposes of generation, and thus for purposes of determining negative benefits, except on the day the water would have arrived had it not been stored at Allatoona.

[760]

This assumption simply ignores the true, basic purpose of the flood-control requirements at Weiss and the substantial generation from Weiss storage which occurs as a result of operating Weiss in accordance with such requirements during periods of high flows.

Q. What do you consider to be the purpose of these Corps' flood-control regulations? A. The primary objective of the Corps of Engineers' flood control regulations applicable to Weiss project (Exhibits Nos. 4, 5 and 6) is to achieve significant improvement in downstream flow conditions resulting from high to moderate frequency floods. The attainment of this primary objective prevents a quick return to the rule curve and requires utilization of Weiss storage to withhold portions of flows to reduce damage downstream. The Corps of Engineers' "Alabama-Coosa River Basin Reservoir Regulation Manual, Appendix B, Weiss Reservoir" confirms that this is the primary objective of these regulations. The Corps of Engineers consulted with officials of Alabama Power Company prior to putting these flood-

[754] Q. Please state your name.

[758] A. J. H. Miller, Jr.

[758]

data in Exhibit No. 29, it is my opinion that a reasonable charge to be borne by the licensee as the cost of the Staff's studies made for the purpose of estimating annual headwater benefit charges in this proceeding is $13,750. This amount represents the result of decreasing $18,724 by the 34% overhead charges indicated for the office of General Counsel and Federal Power Commission.

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[759]

their use of that interpretation to foreclose use of Weiss storage above Area A? A. No, I certainly do not. While these witnesses for the Staff have ambiguously qualified the time period within which they interpret the rules to require a return of the Weiss reservoir surface to Area A with phrases "as quickly as reasonably feasible" and "as quickly as reasonably possible", it is apparent that each of these witnesses would have the Examiner and Commission conclude that a

substantial portion of the storage capability existing and used by the licensee for generation of electricity at Weiss reservoir should not be recognized for purposes of computing negative benefits in this proceeding because to do so would run counter to some alleged Corps of Engineers' restriction which operates during floods to prohibit or prevent the licensee's use of this storage for generation of electricity on days other than the day the water, if not stored at Allatoona, would have arrived at Weiss. In fact, this "quick return" interpretation is the basis for the Staff's assumption in its calculations, to licensee's detriment, that water withheld at Allatoona when Weiss reservoir surface is above Area A is not usable at Weiss for purposes of generation, and thus for purposes of determining negative benefits, except on the day the water would have arrived had it not been stored at Allatoona.

[760]

This assumption simply ignores the true, basic purpose of the flood-control requirements at Weiss and the substantial generation from Weiss storage which occurs as a result of operating Weiss in accordance with such requirements during periods of high flows.

Q. What do you consider to be the purpose of these Corps' flood-control regulations? A. The primary objective of the Corps of Engineers' flood control regulations applicable to Weiss project (Exhibits Nos. 4, 5 and 6) is to achieve significant improvement in downstream flow conditions resulting from high to moderate frequency floods. The attainment of this primary objective prevents a quick return to the rule curve and requires utilization of Weiss storage to withhold portions of flows to reduce damage downstream. The Corps of Engineers' "Alabama-Coosa River Basin Reservoir Regulation Manual, Appendix B, Weiss Reservoir" confirms that this is the primary objective of these regulations. The Corps of Engineers consulted with officials of Alabama Power Company prior to putting these flood-

[760]

control operating requirements into effect, and it has always been the licensee's understanding of these requirements, based upon conferences with the Corps of Engineers, that storage in Weiss reservoir was to be utilized to protect downstream owners and, during operations under these rules, that the licensee was to utilize the full discharge capability of its power plant

[761]

then available for the generation of electric energy to satisfy the licensee's load requirements. The Staff's refusal to recognize this storage in its calculations is thus a non-recognition of storage which the Corps' flood-control regulations require the licensee to utilize and with which the licensee in fact generates substantial amounts of energy on days subsequent to the day the water arrives at Weiss.

Q. Would you explain in general terms how these flood-control regulations affect the generation of energy at Weiss when Weiss operates pursuant thereto? A. Yes. When Weiss reservoir rises above the top of the power pool curve but remains below elevation 564, the reservoir is said to be in Area B as shown on Plate 3 which is attached to Exhibit No. 1 in this proceeding. Under these conditions, Rule No. 3 of the Corps of Engineers' flood-control regulations applies as seen in Exhibit No. 5, and the required maximum outflow from Weiss project is the full discharge capacity of the Weiss power plant. No flood gate operations are required under these conditions. It is therefore apparent that so long as Weiss reservoir operates in Area B, below elevation 564, and all three turbines at Weiss are available and operating, releases are restricted by Corps' rules to releases through the three units of the power plant at full gate. Under these conditions and Corps' restrictions, therefore, a

[762]

quantity of water stored at Allatoona on a particular day when Weiss reservoir is in Area B would, if released rather

than stored at Allatoona, be placed in Weiss storage and eventually used through Weiss turbines to generate electricity, so long as the release would not have caused Weiss reservoir to exceed elevation 564. A negative benefit should be awarded at Weiss during any period when Allatoona stores water and such water, if not stored at Allatoona, could have been used to generate energy through Weiss turbines. It is, therefore, completely unreasonable and unrealistic for the Staff to ignore Weiss storage which is required by the Corps' flood-control regulations and deny negative benefits to the licensee when Allatoona stores water under those conditions.

When Weiss reservoir is rising above elevation 564, Rule No. 5 of the Corps of Engineers' flood-control regulations applies as seen in Exhibit No. 5, and the required maximum outflow from Weiss project is 40,000 cfs unless a higher rate is specified by the induced surcharge schedule which is a part of the record as Exhibit No. 6. It will be seen on Exhibit No. 6 that the 40,000 cfs maximum outflow required under Rule No. 5 is increased according to Weiss pool elevations and concurrent rates of inflow. Until application of this induced surcharge schedule requires an increase in maximum outflow, and assuming all three units of the Weiss power plant to be operating,

[763]

approximately 26,000 cfs of water would be discharged through the power plant generating energy at full gate and the remaining 14,000 cfs would be discharged through use of the spillway, a total discharge of 40,000 cfs pursuant to Rule No. 5. Any inflow to Weiss reservoir in excess of this 40,000 cfs would have to be placed in Weiss storage, and some substantial part of this stored water would eventually be used to generate energy through Weiss turbines. At such time as the Weiss pool elevation and concurrent rate of inflow compel obedience to the induced surcharge schedule (Exhibit No. 6), the restricted outflow would be increased

accordingly. For example, an inflow of 100,000 cfs and pool elevation of 568 require maximum outflow or discharge of 41,000 cfs according to Exhibit No. 6. Again assuming all three units at the Weiss plant to be operating, this results in a release or discharge of approximately 26,000 cfs through the three turbines of the Weiss power plant at full gate, a spilll of 15,000 cfs and storage of 59,000 cfs in Weiss reservoir. Some substantial part of this 59,000 cfs stored in Weiss reservoir will eventually pass through Weiss turbines and be used to generate electricity, not only at Weiss but at Lay, Mitchell and Jordan. The Staff nevertheless improperly fails to award negative benefits to the licensee when Allatoona withholds water which would have arrived at Weiss under those conditions.

[764]

The precise amount of generation at these four plants which will result from use of Weiss storage in Area B and above elevation 564 can only be determined by using the procedures which we have followed in computing generation at these four plants operating without Allatoona. These procedures are explained in detail in my prior testimony between pages 226 and 262 of the transcript and are illustrated on Sheet 2 of Exhibit No. 9. The Staff has not followed these procedures, again ignoring this required use of Weiss storage and the resulting generation of electricity with water placed in such storage.

Q. Mr. Miller, the Staff emphasizes that while it has denied the licensee negative benefits at Weiss when water stored at Allatoona would, if not stored, have arrived at Weiss when its reservoir was above Area A, it has not charged the licensee with positive benefits at Weiss when water released from Allatoona arrived at a time when Weiss reservoir surface was similarly above Area A. In other words, the Staff may be contending that its failure to recognize Weiss storage under these conditions for purposes of determining negative gains or benefits is offset by its failure to charge

the licensee with positive gains or benefits under similar conditions. Would you care to comment on this? A. Yes. I should first reiterate and emphasize that the energy gains computed by the licensee at its four plants

[765]

attributable to Allatoona during 1961-1963 have been determined according to the same methodology approved by the Federal Power Commission in two recent headwater benefit assessment proceedings, *South Carolina Electric & Gas Company*, Docket No. E-6468, and *Virginia Electric & Power Company*, Docket No. E-6684; that is, by comparing the actual generation recorded at the licensee's four plants during this period (representing generation which did in fact occur at these four plants with regulation of flows at Allatoona, the federal headwater improvement) with the quantity of electricity or energy which it has been computed these four plants would have generated during this same period if Allatoona had not been in existence. During the three-year period, 1961-1963, the Staff found energy gains attributable to Allatoona of 193,324,333 Kwh and the licensee found apparent energy gains (uncorrected for error in measurement) attributable to Allatoona of 154,493,773 Kwh, a difference of 38,830,560 Kwh. This difference is the result of the licensee's application of and the Staff's failure to apply the above described basic methodology. The licensee has made no detailed studies using incorrect methods such as used by the Staff to determine the specific portion of such difference which is attributable to the Staff's non-recognition of storage availability and use at Weiss, Lay, Mitchell and Jordan plants or what specific portion of such difference

[766]

is attributable to the Staff's misapplication of so-called "K" factors. These positive and negative benefits, however, very definitely do not offset. Negative benefits, which serve to

[766]

reduce the net energy gains for which the licensee is to be charged in this proceeding, would be substantially greater than the positive gains which might accrue to the licensee under these same conditions.

Q. Mr. Miller, have you prepared an exhibit which compares the monthly energy gains at the Company's four plants attributable to Allatoona as determined by the Staff and as determined by the licensee in their respective studies? A. Yes, I have.

Q. I show you a document marked "Alabama Power Company Exhibit No. 50, Comparison of Energy Gains (Kwh), 1961-1962-1963", and ask you if this is the exhibit to which you refer? A. It is.

COUNSEL: Mr. Examiner, we request that this document as identified by Mr. Miller be marked for identification as Exhibit No. 50.

Q. Would you briefly state the significance of this exhibit. A. This exhibit illustrates month by month during the three-year period, 1961-1963, the energy gains determined by

[767]

the licensee and the Staff at Weiss, Lay, Mitchell and Jordan plants and the monthly differences between the two.

Q. Mr. Miller, have you determined the times, if any, after the first two units at Weiss were placed in operation in 1961, and the third unit went into operation in 1962, when any one of these units was not operating or operable during this three-year period on days when Weiss reservoir was above Area A or would have been above Area A under conditions without Allatoona? A. Yes. When Weiss reservoir pool elevation was above Area A or would have been above Area A without Allatoona during this period, each of these units was operating or operable at all times from the date each unit was placed in operation except on October 3, 1962, when one unit was not operating for part of that day.

Q. In calculating generation at Weiss without Allatoona when Weiss reservoir was above Area A during this three-year period, have you taken into consideration the outage of this one unit on that date? A. Yes, I have. With the exception of that one day and, of course, with the exception of any days prior to operation of any unit, we have recognized each of the three turbines as available for generation at Weiss on all days during this period when the Corps of Engineers' flood-control regulations were applicable and in effect.

[754] REBUTTAL TESTIMONY OF J. H. MILLER, JR.

Q. Please state your name. A. J. H. Miller, Jr.

* * *

[773] attributable to the federal headwater improvement equal "actual generation–with Allatoona" minus "calculated generation–without Allatoona." The Licensee has thus observed the principle applied in the very proceedings to which Mr. Hay makes reference.

On the contrary, the Staff has split the licensee's plants and first computes energy gains at Weiss with and without Allatoona, omitting use of Weiss storage in the process. The Staff then separately computes energy gains for the licensee's Lay, Mitchell and Jordan plants with and without Allatoona but only after elimination of the licensee's Weiss storage plant from the river and without utilization of storage available in forebays at such plants. The Staff's method prevents the Staff's use of the basic equation applied in these earlier proceedings–a comparison of calculated generation with actual generation to arrive at energy gains. Actual generation at Lay, Mitchell and Jordan during most of this period includes effects of regulation at Weiss, but the Staff insists that Weiss must be eliminated from the river before calculating generation at those three plants without Allatoona. The Staff's comparison of calculated and actual generation at Lay, Mitchell and Jordan would thus be a meaningless comparison of apples and oranges. Actual generation at Weiss reflects generation with utilization of all of Weiss storage as required by actual

[774]

circumstances. Since the Staff did not utilize this storage in calculating generation at Weiss without Allatoona, there again can be no reasonable comparison of actual and computed generation in determining energy gains at Weiss. The Staff's method of determining energy gains is thus a substantial departure from the methodology recognized and approved in these prior proceedings.

The advserse effects of the Staff's use of these unprecedented procedures are substantial. The only reasonable way to determine how a licensee's plants have been benefited during a particular period of time by regulation of flows at an upstream federal headwater improvement is to remove the federal headwater improvement from the river and permit all of the licensee's plants to operate as it is reasonably calculated they would have operated during that period if the federal headwater improvement had never been constructed. It is simple arithmetic that the greater the quantities of calculated generation at the licensee's four plants operating without the federal headwater improvement, the smaller will be the net gains realized by the licensee attributable to the federal headwater improvement. This is true because the difference between actual generation at these plants with the federal headwater improvement and calculated generation at these plants without the federal development necessarily decreases with an increase

[775]

in the calculated generation. The Staff's method unreasonably denies the licensee the right to operate its four plants together in accordance with applicable operating rules to greatest advantage with recognition and use of all storage to produce the amount of generation which would have been reasonably realized during this three-year period if Allatoona had not been in existence. In addition, the Staff's method unreasonably reduces the calculated generation at Weiss and at Lay, Mitchell and Jordan, since Weiss storage,

ignored by the Staff, would have contributed substantial generation without Allatoona not only at Weiss but at these three downstream plants.

Q. Mr. Miller, commencing at page 355 of the transcript, Staff counsel interrogated you at some length about your method of determining the conversion factor as "K" factor used to convert turbine discharge to kilowatt hours. For purposes of clarification, would you briefly explain the derivation of the conversion factors which you used in your calculations of energy gains at the licensee's plants? A. Yes. As I have stated, the procedures used by the licensee to compute net energy gains involve removal of the federal headwater improvement from the Coosa River and the operation of Weiss, Lay, Mitchell and Jordan plants with Coosa River flows which have been adjusted to eliminate effects of Allatoona regulation. Calculation of generation

[776]

these plants without Allatoona permits a realistic illustration of the amount of energy these plants could have generated without Allatoona regulation and with utilization of all Weiss storage capabilities. When our studies indicated that all water through the turbines of any particular plant on a particular day would be passed at the same turbine gate opening, whether best or full gate, with and without Allatoona in the river, we utilized a conversion factor obtained by dividing the actual daily generation (Kwh) on that day at that plant by the actual daily turbine flow (dsf) on that day at that plant to obtain a conversion factor representing the actual Kwh per dsf for the day in question. The computation of these daily conversion factors is therefore based upon actual data taken from the plant log sheets and, significantly, the daily conversion factors computed under these conditions and in this manner are 93.24 of all conversion factors used by the licensee in its calculations and are the same as the conversion factors used by the Staff in its calculations of "K" factors for those same days.

[776]

When we ascertained that all water would not be passed through the turbines at any particular plant at the same gate opening on a particular day with and without Allatoona, it was apparent to us that a proper result could not be obtained by arbitrarily using an assumed "K"

* * *

[789]

Exhibit No. 38.

Q. On page 174 of the transcript, Staff witness Rothberg explains how he treated benefits which might have been provided by Weiss to Lay, Mitchell and Jordan, in effect stating that benefits to Lay, Mitchell and Jordan were assumed to be first provided by Allatoona since it was built ten years prior to Weiss and any other assumption would deny a positive benifit-cost ratio at Allatoona. Do you agree with Mr. Rothberg? A. Mr. Rothberg is, of course, attempting to justify the Staff's calculation of energy gains at the licensee's Lay, Mitchell and Jordan plants without consideration of the licensee's Weiss storage project, but I cannot understand his reasoning in his response on page 174 of the transcript. The licensee's Weiss Dam was constructed by the licensee as a part of FPC Project No. 2146 at a cost of $38,627,934 [Exhibit No. 40] exhibit. 2, sheet 1), a substantial investment which the licensee would not and could not have made had the licensee not envisioned and anticipated the substantial benefits which the total storage at Weiss would confer both in at-site generation and in generation at the licensee's downstream plants involved in this proceeding. The Federal Power Commission found in its September 4, 1957 order issuing the license for Project No. 2146 (Item D by Reference) that the project was economically feasible and best adapted to a comprehensive plan for the development of the Coosa River for the

[790]

use or benefit of interstate or foreign commerce. There is, therefore, no justification for excluding the licensee's Weiss storage development from the Coosa River when computing energy gains at the licensee's downstream Lay, Mitchell and Jordan plants merely because the construction of Allatoona predated that of Weiss. Contrary to Mr. Rothberg's assertions with respect to the alleged adverse effect on the benefit-cost ratio earlier established for Allatoona which would result from a recognition of Weiss storage, the operation of Weiss project during this three-year period, with full recognition of Weiss storage capabilities, actually improves the benefit-cost ratio at Allatoona as described by Staff witness Rothberg. This is so because the average of the annual headwater benefit payments computed by the licensee in its studies in this proceeding is greater than the average of the annual payments made by the licensee during the ten-year period, 1950-1960, prior to Weiss construction. The average annual payment has been increased during the three-year period here under consideration with recognition and use of all Weiss storage in calculating energy gains at the Company's down-stream plants.

Q. You have previously testified on page 219 of the transcript that turbine capacity at the licensee's Jordan plant was about 20,600 cubic feet per second at full gate during this three-year period. You have further pointed out that the

[793]

gains alleged to be realized at the licensee's Coosa River plants from these releases during June, July and August in 1961, 1962 and 1963, to hold the storage reservoirs in The Southern Company System in other river basins at higher pool elevations at the end of August in each year, an alleged resulting increase in dependable capacity for The Southern Company System in the month of annual peak loads.

[793]

Q. Mr. Miller, do you agree with Mr. Rucker's conclusions with respect to alleged gains in dependable capacity by the licensee or some other entity as stated in his prior testimony? A. No, I certainly do not. In the first place, Southern Services, Inc., negotiated the Georgia Power Company contract with Southeastern Power Administration as agent for Georgia Power Company, not as agent for Alabama Power Company, and no official or representative of Alabama Power Company at any time participated in the contract negotiations. Alabama Power Company to my knowledge never received any advice after that contract was signed from Southern Services, Inc., Southeastern Power Administration, Georgia Power Company or anyone else which constituted notice of any sort of assured releases or withdrawals from storage at Allatoona during 1961, 1962 or 1963. While Southern Services, Inc., does act as the licensee's agent for a number of purposes, such agency is

[794]

expressly authorized. It is certainly not true that every act of Southern Services, Inc., for any other operating company of The Southern Company System is as the licensee's agent. It is significant that Mr. Rucker has stated and assumed in his testimony on page 494 of the transcript that Southern Services determines an economic dispatch of power from resources available to the operating companies to meet the combined load of The Southern Company System. This is incorrect, whether you consider day-to-day dispatch or advance planning of use of those hydro plants. Southern Services, Inc., does not and did not during the years 1961, 1962 and 1963 determine an economic dispatch of hydroelectric generating resources of The Southern Company's individual operating companies. Alabama Power Company unertook its own advance planning of the manner in which its hydroelectric plants would be dispatched for capacity requirements during this period and, on a day-to-day basis, its hydroelectric projects are and were during this period dispatched by the licensee's own operator at Magella.

Since 1957, the Department of the Interior, not Georgia Power Company, has been the exclusive dispatching agent for power from Allatoona and therefore has, in operations under the contract, made a unilateral determination of dispatches from Allatoona reservoir. I have investigated the day-to-day operations under the Georgia

[795]

Power Company-Southeastern Power Administration contract applicable and in effect during the three-year period with which we are here concerned. Each week, Southeastern Power Administration advises Georgia Power Company how much capacity and energy will be available under the contract the following week from each of the five federal projects identified in the contract. Of these five storage plants, Allatoona is the only federal plant located on the headwaters of the Coosa River which, of course, is the river in which the licensee's Weiss, Lay, Mitchell and Jordan plants are located. In keeping with the provision in the contract (Paragraph 1.5, Items J and K by Reference) provides that the Department of Interior's commitment to make capacity and energy available is an overall commitment and may be met from the totality of these resources (5 federal plants), I have ascertained that Southeastern Power Administration does in the operation of the contract frequently advise Georgia Power Company by telephone that it is rescheduling the previously announced alleged commitment from a particular individual plant and that the energy and capacity, or some portion thereof, previously specified as being available from that particular plant will not be available from that plant but from another of the five federal plants. Even Georgia Power Company and Southern Services, Inc., could not therefore depend upon the dispatch of

[796]

energy and capacity from any particular federal plant at any particular time in advance of or during the three-year period,

[796]

1961, 1962, 1963, because of the wide grant of discretion to and exercise of such discretion by Southeastern Power Administration in operations under the contract. Since there is no assurance of any particular amount of generation from Allatoona at any particular time, then there is no way for anyone to be certain of a particular amount of withdrawal from storage at Allatoona at any particular time.

Q. Mr. Miller, in his testimony on page 495 of the transcript, Interior witness Rucker assumed a recurrence of the critical flow conditions which occurred on the Coosa River in 1931 and then determined under those conditions that the federal headwater improvement, Allatoona, would have been drawn down from June through August from elevation 839.5 to elevation 826.5 with a resultant release of 130,700 acre-feet from Allatoona during that period. Would you care to comment on this hypothetical drawdown at Allatoona about which Mr. Rucker testifies and which serves as one of the bases for his capacity gains determination? A. Yes. It is first significant to note that the Corps of Engineers' operating rules applicable to Allatoona (Exhibit No. 18) provide a top of power pool elevation of 840 feet above mean sea level from May 1 through August 31 each year. This Exhibit No. 18 (Appendix A, Chart

[808]

CROSS EXAMINATION

BY MR' LEVANT:

Q. Mr. Miller, on page seven of your prepared rebuttal testimony you state, "The primary objective of the Corps of Engineers' flood-control regulations applicable to Weiss project is to achieve significant improvement in downstream flow conditions resulting from high to moderate frequency floods."

Is it your understanding that the objective of the Corps is to improve downstream flow conditions resulting only from high to moderate frequency floods and not any other frequency floods? A. If you will refer to the Alabama Coosa River Basin Reservoir Regulation Manual, Appendix

B, which was introduced as an Item by Reference this morning—I didn't get that number.

Q. BB. A. —Item by Reference BB, page B-8, paragraph numbered 19, the flood control regulation plan for Weiss Reservoir will provide substantial reductions in downstream flood flows during minor floods. The limited amount of storage allocated to

[809]

flood control will generally not affect any appreciable reduction in major flood peaks, but the available storage will be utilized through an induced surcharge schedule so that the peak discharge from major floods will not be any greater than would have occurred under natural conditions.

I believe that responds to your question.

Q. In other words, Mr. Miller, the Corps intends to cover all the frequencies of floods, including the minor frequency floods, in addition to the high and moderate floods which you have referred to? A. Well, certainly the reservoir has a capacity reserved for flood control. and of course while the water stored in there is stored for flood control the reservoir itself doesn't recognize the frequency of the flood, or the magnitude, other than the fact it is getting water stored in it.

Once that water is stored in it, of course, it is discharged, partially through the turbines to generate energy, and partially over gates, in accordance with surcharge tables, and in accordance with the degree of control specified in the item I just read.

Q. Right. But the Corps, its manual deals with all types of frequency floods, and not merely with moderate frequency floods, is that not so? A. Yes, I think that is correct.

Q. Would you refer to pages 6 through 9 of your prepared

[810]

testimony, where you state, in substance, that it is the Staff's assumption in its calculations that water withheld at Allatoona, when Weiss Reservoir surface is above Area A and below elevation 564, Area B, is not usable at Weiss for purposes of generation, and thus for purposes of determining negative benefits, ignores the true basic purpose of flood control requirements at Weiss.

In this connection, Mr. Miller, I cite you paragraph 30 of the Corps of Engineer's Alabama-Coosa River Basin Reservoir Regulations Manual, Appendix B, which I believe you have before you, Item BB, and I quote therefrom:

"Regulation plans for the flood control project Allatoona, Weiss, and Logan-Martin"—strike that"have been developed so that operations during the rising phase of a flood will be completely independent of each other. Following a flood, the emptying of flood storage at Allatoona may prolong the time required to evacuate flood storage at Weiss and Logan and Martin.

"Insofar as practical, without depreciating the flood control value of Allatoona, releases from that project will be made so as to minimize any undesirable condition that might be created by the emptying operations.

"Also, in the event of a localized storm centered over one of the downstream reservoirs, operations at the upstream project, which includes Allatoona, will be modified to reduce

[811]

outflow to the maximum extent feasible so as to alleviate the downstream flood conditions as much as possible."

Mr. Miller, I refer you specifically to that part which indicates during a rising phase of a flood each project, Alla-Toona, Weiss, and Logan-Martin, will operate independent of each other, and ask you does this mean to you that water being withheld at Allatoona should, instead, be stored in Area B at times when Weiss Reservoir water

surface is already in Area B? A. This means to me just what it says. During the rising phase of a flood will be completely independent of each other. I don't understand your question.

Q. Well, are you assuming, under those conditions, that water should be stored at Weiss in a case when the Weiss Reservoir water surface is already in Area B, as you indicated in your energy determinations? A. I make the assumption that Weiss is operated in accordance with this manual in my energy determinations, and in accordance with the rules prescribed in this manual, which are those prepared and issued by the Corps of Engineers after discussions and considerations with us. That is all.

Q. Mr. Miller, didn't you, in your determinations, your energy determinations, assume that Allatoona was nonexistent and therefore assumed that the water withheld at Allatoona would be stored in Weiss Reservoir in a case when the water surface

[812]

was already in Area B? A. Under my assumptions, Allatoona not being in existence, I merely applied the rule applicable to Weiss Reservoir contained in this manual to determine how much water would be stored in Weiss Reservoir. And the applicable rule which would apply in the discharge—in the storage of and discharge of water from Weiss Reservoir.

Q. Yes, but this manual takes into consideration the existence of Allatoona and storage in that reservoir; whereas, in your computations you assumed that Allatoona was nonexistent.

Did you make some adjustment for storage which would normally have been in the Allatoona Reservoir? A. Well, I made no adjustment because I considered none necessary. In the three periods covered these rules appeared perfectly adequate to maintain a reasonably common control of floods, and I saw no need to give any further consideration to that.

[812]

Q. So, in other words, you made no adjustments? A. None was necessary, and I made none—in my opinion.

Q. I would like to refer you to paragraph 22 of the Weiss Reservoir regulation Manual, Item BB. A. I'm sorry, I missed that.

Q. I refer you to paragraph 22 of the Weiss Reservoir

[813]

Regulation Manual. A. Oh, I see.

Q. Item BB. A. Yes.

Q. The paragraph is headed "Reservoir Operation for Power Production."

I have specific reference to the point that reads, "A curve delineating the storage in Weiss Reservoir, allocated to power operation and to flood control throughout the year, is shown on Chart 19."

Incidentally, this curve is Exhibit No. 4 in this proceeding, and is also shown on Plate No. 3 in Exhibit No. 1.

Paragraph 22 continues, "This seasonally varying top of power pool curve is a firm division between the power and flood control pools, and normally the reservoir level will be maintained at or below the curve, except when storing flood water."

Mr. Miller, do you agree that this Area B, which is above this "firm division" curve, should be limited to storing the least amount of water possible so as to leave it free for the independent" control of high flows, in the drainage area below Allatoona, and above Weiss? A. Where are you quoting that, above Allatoona and below Weiss?

Q. That is paragraph 22. The terms that I quoted appear

[814]

in paragraph 22.

THE WITNESS: May I have the question read? I got lost some place.

(Question read.)

THE WITNESS: No.

MR. GATCHELL: Do I understand that question merely means does he think that should be the rule?

MR. LEVANT: Yes, whether it should be limited to storing the least amount of water possible.

THE WITNESS: My answer is "No."

BY MR. LEVANT:

Q. Mr. Miller, refer to paragraph 23, if you would, of the manual, which reads—do you have that in front of you? A. Yes.

Q. "Whenever the reservoir reaches the elevation shown on the storage delineation curve, the power plant will be operated as necessary up to full gate capacity to discharge the amount of water required to keep the reservoir level from exceeding that shown on the storage delineation curve."

Now would you explain why you apparently ignored this instent by your assumption of storing water at Weiss that is already stored at Allatoona, when the Weiss water surface is already above the delineation curve? A. But I didn't ignore it, Mr. Levant. I did just exactly that. I applied this basic rule, and the basic method-

[815]

ology included in this manual. If the intent of this manual was to store a minimum amount above the curve, a minimum is zero and you could just pass inflow. But the intent of this manual is to use the flood storage zone to store water to minimize flows downstream.

Q. Well, but in your energy gains, you claimed negative benefits for that storage, have you not? A. Of course, it goes through the turbines, ultimately, in whole, or in substantial part.

I claimed negative benefits only for that portion which I estimated would go through the turbines.

Q. Well, but in order to do that you would have had to store the water in Area B, would you not? A. That is what happened when you apply these rules; that is why Area B is there.

[815]

Q. There is consistent with your assumption, then, Allatoona is nonexistent and that there is no storage at Allatoona, is that not so? A. Yes, sir, and that this project as stated in the manual is operated on the rising part of the flood independently of Allatoona.

Q. But in claiming your negative benefit at Weiss you are assuming that this water is being stored at Allatoona.

Now you can't have it both ways. If you are assuming Allatoona isn't there then you can't have potential negative benefits

[816]

at Weiss resulting from storage at Allatoona, can you? A. I am not sure I understand your question, but I applied this basic methodology, and that was to determine the generation at downstream plants of Alabama Power Company, without Allatoona being in existence.

You already have, as a matter of record, the genrations with Allatoona being in existence, and the difference, therefore, can be considered to be attributable to Allatoona. The basic methodology merely considered that Allatoona was gone and then traces that water, the effect of that disappearance, nonexistence, down the Coosa River from one plant to another.

Q. Well, Mr. Miller, in claiming negative benefits at Weiss you must have assumed that there was storage at Allatoona that was holding the water back, did you not? A. I don't have to assume that, as a matter of fact there is storage in Allatoona Reservoir.

Q. That assumes that Allatoona is in existence under those conditions? A. All right. So that is the actual, that is correct.

Q. The basis for your study is the assumption that Allatoona does not exist? A. That is correct.

Q. In effect you are having it both ways, are you not? A. I am trying to get the difference between the two

[817]

as far as generation at the downstream plants is concerned, with and without. That is what I have done.

* * *

[824]

A. What storage?

Q. Storage at Lay, Mitchell and Jordan? A. In my view the difference between the Staff's quantity of some 193 million and mine of 154 million is attributable to a fact that the Staff did not apply the basic methodology of removing from the river, Allatoona, and then determining generation generation at the downstream plants of licensee in accordance with applicable rules and reasonable operating conditions.

What particular part of it is assignable to any particular portion, I made no specific determination. It is the aggregate that I was looking for.

Q. Now I would like to refer you for a moment to Exhibit 50. A. Yes, sir?

Q. I believe that figure to which we have mad reference appears on Exhibit 50 at the bottom of the page. However, there seems to be some inconsistency between the two numbers there. Perhaps it is a mathematical error. Would you explain? A. Excuse me. Go ahead.

Q. Would you explain the difference there? A. I notice that there is a difference.

On page 12 it is 38,830,560, and on the Exhibit it is 38,830,650. That is a difference of 90 kilowatt hours. It apparently is a typo as far as I know; I really don't know. I

* * *

[825]

Q. In your testimony, on pages 9 through 11, you state in substance that when Weiss Reservoir is rising above eleva-

[825]

tion 564 the surcharge flood storage area that the Staff fails to award negative benefits to the licensee when Allatoona withholds water which would have arrived at Weiss for storage, if Allatoona did not exist.

Do you believe, Mr. Miller, if Weiss could take over the flood control regulations, performed by Allatoona, you have assumed in your energy-gain calculations that the same degree of flood regulation and protection would be achieved downstream from Weiss as under present operations? A. No, I do not.

[826]

Q. Mr. Miller, if you were operating the reservoir for the control of flood flows, would you release the water stored during a flood as quickly as reasonably feasible—that is, as quickly as the water could be released without increasing damage downstream so that you would have space available in the reservoir to store water during the next flood period, or would you just let it remain in storage until you felt like releasing it, regardless of the fact that you would not know precisely when you might need the space again? A. I would operate it, if it were Weiss Reservoir, in accordance with this manual which does not require releases as quickly as feasibly practical, in accordance with what you said.

This manual says when you are in Area B you will withdraw the water through the turbines. When you are above elevation 564, after you have crested it, it does not say to maintain the same rate of outflow, which would be necessary to keep from going above. it says the same gate opening. And as your head falls, the amount of water through those gates falls, and therefore the discharge from the plant decreases.

Therefore, this manual does not require the discharge from this storage area, storage volume, at the maximum rate as you define it.

Q. Mr. Miller, doesn't the manual require or provide that in periods of flood, heavy floods, that a downstream project would be required—that Weiss would be required to spill a

[827]

greater amount than the 40,000 referred to in the manual? A. That Weiss would be required?

Q. Yes. A. If the rules applicable to Weiss Reservoir operations, spelled out on Chart 20, of BB, required, then my answer is yes. And that is the way I operated the reservoir in my study.

* * *

[828]

BY MR. LEVANT:

Q. Would you explain why, Mr. Miller, you depreciated the flood control value of Allatoona by assuming flood flows, stored at Allatoona, to be stored instead at Weiss Reservoir causing a resulting increase in outflow at Weiss and less protection downstream from Weiss? A. That is kind of like "why did you beat your wife", yes. I don't agree I did any such thing.

Q. Well you did— A. Let me respond to the question.

Q. Yes. A. All I did was assume Allatoona was not in existence, then I applied these regulations right here in this book to the

[829]

best of my ability.

This particular quotation you read says to me that insofar as praticable, and I'm quoting "without depreciating the flood control value of Allatoona, releases from that project, Allatoona", and that is my wording, "—will be made so as to minimize any undesirable condition that might be created by the emptying operations", which I in turn, assume to mean Allatoona's emptying operations.

[829]

This is apparently a burden placed on Allatoona, and if Allatoona doesn't exist, that burden doesn't exist.

Q. Well, but, Mr. Miller, isn't it unrealistic to talk about flood control operation at Weiss without taking Allatoona into consideration in the function it fulfills in flood control? Don't you have to look at them together. Don't these regulations deal with the total picture, rather than Weiss itself, as you have done? A. These regulations pretty well indicate that they are dealing with Weiss. The fact that it says that they are designed to operate on the rising phase of a flood, independently, I have no basis whatsoever to assume that there would be any modification in these regulations if Allatoona did not exist.

PRESIDING EXAMINER: They would store more water in Weiss you mean?

THE WITNESS: Yes, they would store water in Weiss, and part of it would be going through the turbines, inescapable, as it does.

[830]

PRESIDING EXAMINER: Even with Allatoona in the picture, when you have a flood control condition, is it possible to store more water at Weiss than without Allatoona?

THE WITNESS: Is it possible to store more water?

PRESIDING EXAMINER: Yes.

THE WITNESS: It is possible, but I would think unlikely.

BY MR. LEVANT:

Q. It would be contrary to the regulation manual, too, wouldn't it? A. No, I'm being particular. That is why I said it would be unlikely. You could have a local application, which you might want to take into consideration, whereby you would store more water.

Really, it is improbable, because it would be difficult to occur, but a situation, I think, could occur which might cause you to want to do it.

Q. In any case, the treatment of Weiss, as you have treated it, for storage purposes, ignores the reality of the situation, does it not? A. No, sir. It recognizes the reality of this book, which is published by the Corps of Engineers, and it ignores a hypothetical insinuation in your question.

Q. Do you know whether the Corps took the existence of Allatoona into consideration in preparing this regulation manual for Weiss?

[831]

A. I don't know.

Q. Do you think they did? A. I would think they did, yes.

* * *

[893]

J. H. MILLER, JR.

having previously duly sworn, resumed the stand and testified further as follows:

CROSS-EXAMINATION (Continued)

BY MR. LEVANT:

* * *

[920]

Q. Do you also agree that this 49.4 million kilowatt hours of generation at Lay, Mitchell and Jordan includes six million kilowatt hours, which is attributable to upstream storage? A. Let's see, I believe I would have to see that other letter in evidence.

Q. Exhibit 25, you are referring to? A. It may be, yes.

MR. VOGTLE: Is that it?

THE WITNESS: Yes, this is it. Yes. It is explained in Exhibit 25. I have no basis for concluding otherwise.

BY MR. BELL:

Q. And since you show no contribution by Weiss, during that month, it is safe to say the entire 6 million came from Allatoona? A. I think Exhibit 25 speaks to that point, and the letter speaks for itself. I didn't write it.

[920]

I think the letter points out that it was not necessary to make such a determination—I let it get away from me—if you want me to read that portion of it, I would be glad to do so.

(Document handed back to the Witness.)

THE WITNESS: I quote in part: "Prior to the operational day of Weiss Dam the amount of energy available in August at

[921]

downstream installations from upstream regulation under the dispatching arrangements for Allatoona, in effect at that time, was estimated to be 6 million kilowatt hours, all of which was attributable to Allatoona, and was so reported by them."—Southern Services—and I inserted Southern Services. "Subsequent to the operational date, June, 1961, of Weiss Dam, the amount of generation capable of being generated at downstream installations from upstream storage regulation was higher, being attributable in part to Weiss Dam, and in part to Allatoona, but under the succeeding dispatching arrangement the estimate of generation at downstream installations from regulation at upstream storage developments, including Weiss Dam, and the recording thereof, was continued at 6 million kilowatt hours, including a reporting for August, 1961, 1962, and 1963, no allocation or assignment as between Weiss and Allatoona being necessary. Alabama Power Company, however, reiterates that if allocation or assignments are made, such as for the purpose of use in downstream benefit determination, the portion of such energy usable at downstream plants and assignable to Allatoona would be that portion which was not capable of being produced with regulation otherwise available in reservoirs licensed to, owned, and operated by Alabama Power Company."

The letter was signed by Mr. R. L. Harris.

BY MR. BELL:

Q. Mr. Miller, do I correctly interpret the data which

* * *

[941]

CROSS EXAMINATION (Continued)

BY MR. BELL:

Q. Mr. Miller, would you refer, please, to page 22 of your rebuttal testimony? A. Yes, sir.

Q. In the answer near the bottom of the page you state, As I have stated, the procedures used by the licensee to compute net energy gains involve removal of the headwater improvement from the Coosa River, and the operation of Weiss, Lay, Mitchell and Jordan plants, with Coosa River flows which have been adjusted to eliminate effects of Allatoona regulation.

Calculation of generation at these plants, without Allatoona, permits a realistic illustration of the amount of energy these plants could have generated without Allatoona regulation and with utilization of all Weiss storage capabilities.

Will you tell me, please, what you assumed would be the flood control operation of Weiss Reservoir under the conditions without Allatoona on the river? A. We operated Weiss under conditions, without Allatoona in accordance with the flood control regulations contained in the Weiss reservoir regulation manual, Item BB.

Q. Did I understand you to say yesterday, in answer to a question by Staff counsel, that you operated it for flood

[942]

control without Allatoona the same as you did with Allatoona on the river? A. I operated for flood control and power production in accordance with the regulations contained in Appendix B to the Alabama-Coosa River basin reservoir regulation manual identified as Item BB. Applying the rules contained therein, they may have produced different operations with and without Allatoona, but the same rules were considered applicable.

Q. It is true, is it not, that Allatoona affects the flood flows into the Weiss Reservoir? A. Yes, sir.

[942]

Q. And it is also true that the effect of Allatoona upon the flood flows of Weiss had to be taken into account by the corps of engineers in determining the flood control operation of the Weiss reservoir? A. This is your testimony, I presume.

Q. I'm asking you, is it true? A. I don't know.

Q. You do not have any opinion on the subject? A. I would certainly think they did consider it, Mr. Bell. To what extent they made use of that consideration, I am not sure.

Q. Do you have any basis, or information, to assume that the corps would maintain the same flood control operation for Weiss without Allatoona as it does with Allatoona on the river?

[943]

A. I have no information to that effect, nor do I have any indication that this reservoir would be changed if Allatoona did not exist—this regulation manual would be changed if Allatoona did not exist.

Q. Did you, or anyone in your company, to your knowledge check with the corps of engineers to see whether or not it might be the same or different under the two different conditions? A. I didn't, and I know of no one who did.

* * *

[958]

CROSS-EXAMINATION

BY MR. LEVANT:

Q. Mr. Miller, you are aware of the application filed with the Federal Power Commission for the Weiss project, Project 2146, on December 2, 1955, are you not? A. I am generally aware of it, yes, sir.

[959]

Q. I would like to show you Exhibit "H", which is part of that application, and ask you to read the last paragraph that appears on that page.

MR. VOGTLE: May I have an opportunity to look at it before he reads it?

MR. LEVANT: Sure.

PRESIDING EXAMINER: You may.

MR. VOGTLE: Thank you.

BY MR. LEVANT:

Q. Would you read that into the record, please? A. "The project operations can be effectively and efficiently coordinated with the existing Allatoona, Mitchell, and Jordan Reservoirs, and power plants in the Coosa River basin, and with Martin Reservoir and the power plants on the Tallapoosa River; and with the future projects on the Alabama River. The proposed project, together with existing and other prospective hydro developments, can be coordinated to very good advantage with steam and other available power sources to supply the load requirements of the area. Construction of this project will facilitate future developments on the Coosa River tributaries, and with such developments a still greater degree of food control will be achieved."

Q. Excuse me, is that the end of the sentence there? A. Yes.

Q. Why don't you finish that paragraph?

[960]

A. "The integrated operation of the existing and prospective reservoirs and power plants with the project works for flood control and power generation, as well as for navigation, water conservation, recreation, and other beneficial public uses, will result in best control and utilization of the water resources of the Coosa River Basin and contribute to the same objective with respect to the Alabama River Basin."

Q. Mr. Miller, I ask you to refer to Table 1 of Exhibit "I" of the application to which we have referred. I ask you whether this table entitled "Coosa River Development, Basic Data, for Estimate of Ultimate and Initial Installations", whether that includes the effects of upstream developments?

[960]

I believe there is a reference on that table which would answer that question.

MR. VOGTLE: May I ask what the date of this application is?

THE WITNESS: I was just going to read that.

MR. LEVANT: 1955, I think, December—

THE WITNESS: This application has a stamp on it marked "received, December 2, 1955," which was during the time that the 1948 contract between Southeastern Power Administration and Georgia Power Company was in effect. That contract has since been superseded. I merely mention that.

There is a note contained on Exhibit "I", Table 1, marked 1264, in the upper right-hand corner, which says "1. Includes

[961]

effects of upstream development." Excuse me—the "1" refers to a column shown thereon.

BY MR. LEVANT:

Q. Now, what upstream development does that have reference to, Mr. Miller? A. It has to be Allatoona.

MR. VOGTLE: May I ask at this time, Your Honor, if there have been, to staff counsel's knowledge, amendments of that particular license application which affect the provision from which Mr. Miller first read, or affect the table, or exhibit to which he has just referred?

I know that the license application was amended numerous times, and I know that some of the original projects planned in the initial application were, in fact, amended-out, with substitutions being made.

I, therefore, wonder if there have been amendments subsequent to the date of that application which would be applicable, and which would be pertinent, in an interpretation of what Mr. Miller has read, Your Honor?

MR. LEVANT: I'm not aware of any amendments to the application that would change the information to which we have referred in this application.

MR. VOGTLE: Could I have a look at that last thing he looked at, please? Could you refer me to it?

MR. LEVANT: Sure.

[962]

MR. GATCHELL: May I ask, Mr. Examiner, if Mr. Levant would object if we should come across some amendment which does have some relevance to these two exhibits, some amendment to the application, that was subsequently filed, would he object to having a reference to that in this proceeding?

MR. LEVANT: No, certainly not. I'm not aware of any.

MR. VOGTLE: My point, I think is made by looking at Exhibit "I", Table 1, to which Mr. Miller was referred, where the quantities shown are said in footnote 1 to include the effect of upstream developments, and the installations which are identified hereon I notice one includes the Wetumpka installation, which was subsequently amended-out, and the Jordan II, or what is now known as Walter Bouldin hydroelectric development was substituted therefor.

I think those amendments would be pertinent, and I request as Mr. Gatchell has said, that these amendments be properly incorporated in the record.

I'm sure they are on record and the staff counsel can file them.

MR. LEVANT: I would like to add that the stream flows emanating from Allatoona and reaching Weiss would not have been changed by any of the changes to which you have referred.

MR. GATCHELL: Are you testifying?

MR. LEVANT: No. I'm merely pointing out these projects to which you referred are not located between those two projects,

[963]

namely Allatoona and Weiss.

[963]

MR. GATCHELL: I don't think your statement is correct, Mr. Levant—that is what I'm saying.

MR. LEVANT: Mr. Gatchell, if you have information to the contrary on that, feel free to come forward with it.

As I say, I'm not aware of any amendments.

MR. VOGTLE: I think the point has been made. As we understand it, we have a privilege to place in the record—

PRESIDING EXAMINER: Mr. Levant was agreeable to it, and I see Mr. Bell is agreeable to it, too.

MR. BELL: Yes.

PRESIDING EXAMINER: Is this an exhibit you have reference to?

MR. LEVANT: No, Your Honor, however—

PRESIDING EXAMINER: I wonder, I was going to ask where it comes into this record?

MR. LEVANT: I would like to, if I may—I was going to get to this—to have it marked as an Item by Reference.

PRESIDING EXAMINER: What do you want marked? Just the table?

MR. LEVANT: The two items to which I have made reference here.

PRESIDING EXAMINER: The item has been read into the record. But the table, I don't understand what that is.

MR. LEVANT: It has separate information with reference to

[964]

Exhibit "H". Perhaps we could have the table marked as an item, and I would be happy to make copies of it and distribute it.

PRESIDING EXAMINER: If you are going to do that, I think you better give it an exhibit number, and you may withdraw it and furnish everyone here a copy, and the reporter two copies.

MR. LEVANT: Fine.

PRESIDING EXAMINER: You can put that on the machine and have it ready tomorrow morning.

MR. LEVANT: Fine. Certainly, that is a better idea.

MR. LEVANT: Fine. Certainly, that is a better idea.

PRESIDING EXAMINER: Very well, let me see it.

MR. LEVANT: I ask it be marked for identification.

PRESIDING EXAMINER: What you have reference to is a table entitled "Exhibit I, Table 1, Coosa River Development, Basic Data for Estimates of Ultimate and Initial Installation", which bears up in the right-hand corner a staff number of "1264."

Very well, that will be marked Exhibit 64 for identification.

(The document referred to was marked Exhibit No. 64 for identification)

MR. GATCHELL: If you would like to complete the identification, Mr. Examiner, it is a part of the application for license of Project No. 2146.

[965]

MR. LEVANT: I would like permission to withdraw it, Your Honor, and make copies.

PRESIDING EXAMINER: Do you want to offer it at this time?

MR. LEVANT: I will offer it at this time.

PRESIDING EXAMINER: Is there any objection?

MR. VOGTLE: Your Honor, we reserve the right as has been agreed, to reserve filing in the record any amendments pertinent to the documents that have been offered.

PRESIDING EXAMINER: That is understood by all counsel. Very well, it will be received in evidence.

(The document previously marked for identification as Exhibit No. 64 was received in evidence)

MR. LEVANT: I would like to ask one additional question, Your Honor, for clarification.

BY MR. LEVANT:

Q. Mr. Miller, is it not a fact that the Leesburg Project is now referred to as the Weiss Project? A. That is correct.

* * *

[1174]

Docket No. E.6893

STAFF REPORT
ON
INVESTIGATION OF HEADWATER BENEFITS
COOSA RIVER BASIN
JANUARY 1, 1961, THROUGH DECEMBER 31, 1963
FEDERAL POWER COMMISSION

MARCH 1965

I. *Summary*

This staff investigation pursuant to Section 10(f) of the Federal Power Act, as set forth hereinafter, shows that the Allatoona project, a headwater improvement of the United States in the Coosa River basin, Georgia and Alabama, directly benefited the downstream hydroelectric plants of the Alabama Power Company during 1961, 1962, and 1963, the period covered by this study. Previous investigations have been made for the period 1950 through 1960 and the Company has made payments to the United States for benefits received.

It is recommended that payment for the period January 1, 1961, through December 31, 1963, for headwater benefits received at the Company's Weiss, Lay, Mitchell, and Jordan plants be made to the United States by the Alabama Power Company in the amount of $324,918.

It is further recommended that the United States be reimbursed by the Company for the cost of making this headwater benefits investigation, which cost to date is $17,280.

II. *Historical Remarks*

The Federally-owned Allatoona project, completed in 1950, is located on the Etowah River, a tributary of the Coosa River. It is upstream from the Weiss, Lay, Mitchell, and Jordan hydroelectric plants of the Alabama Power Company, all of which are located on the Coosa River. See Plates 1 and 2. The Weiss reservoir project was placed in

initial operation in 1961. The other three are run-of-river projects which were in operation prior to 1930. On October 11, 1951, the Commission issued an order instituting an investigation under Section 10(f) of the Federal Power Act for the purpose of enabling the Commission to determine whether any of the afore-mentioned run-of-river projects of the Alabama Power Company were directly benefited by the

[1175]

construction and operation of the upstream Allatoona project of the United States, and, if it so finds, to assess against the Alabama Power Company the equitable proportion of the annual charges for interest, maintenance, and depreciation on the Allatoona headwater improvement. Staff investigations showed such benefits were provided and assessments for the years 1950 through 1960 were made by orders of the Commission issued on August 18, 1954; August 9, 1956; October 27, 1959; and February 27, 1962; and amount to $482,031.

III. *Ultimate Development of Coosa River Basin*

The Alabama Power Company is in the process of constructing its planned ultimate hydroelectric development of the Coosa River. See Plates 1 and 2. The Federal Power Commission issued a license in 1957 to the Company for Project No. 2146, which develops the power head between the Company's Lay Dam and the Federal Allatoona project. Project No. 2146 provides for four new hydroelectric developments and redevelopment of Lay Dam, which are scheduled for completion by 1968. As previously mentioned, the Weiss project, first of the new developments, was placed in commercial operation in 1961. The reservoir of the new Logan Martin project began filling in the spring of 1964 and the project was in operation before the end of that year. The Lock No. 3 and Jordan No. 2 projects are under construction. Lay Dam is to have its height increased 14 feet and additional capacity installed. Jordan Dam No. 1, licensed

[1175]

project No. 618, referred to herein as Jordan Dam, is to have its pool elevation raised 7 feet. The Commission's order to increase the pool elevation of Mitchell Dam, licensed project No. 82, by 5 feet and to install additional capacity has been stayed by the Commission.

The Federal Government is also constructing a multipurpose development, Carters Dam, in the headwaters of the Coosa River basin. It is to be located at mile 26.8 on the Coosawattee River, a branch of the Oostanaula River. The latter joins the Etowah River, below the Allatoona Dam, at Rome, Georgia, to form the Coosa River. The reservoir will have 193,600 acre-feet of power storage and is tentatively scheduled to begin filling in December 1968. The project when completed in December 1969 will have an installation of 250,000 kilowatts operating at a head of about 400 feet.

IV. *The Headwater Development–Allatoona Project*

The Federally-owned Allatoona project, with a drainage area of 1,100 square miles, is located in northwest Georgia on the Etowah River, approximately 48 miles upstream from the City of Rome, Georgia

[1176]

and about 160 miles upstream from Gadsden, Alabama. It was constructed by the Corps of Engineers, Department of the Army, for the primary purposes of navigation, flood control, and hydroelectric power. Construction of the project was begun in February 1946 and was completed in May 1950. The hydroelectric installation consists of two 36,000 kilowatt units and one unit of 2,000 kilowatts, a total of 74,000 kilowatts, operating under an average power head of about 135 feet. The head varies from a minimum of 111 feet to a maximum of 140 feet. Provision is made for an additional 36,000-kilowatt unit. One large unit and the small unit went on the line in February 1950 and the second large unit in May of that year. The Southeastern Power Administration, the agency responsible for marketing the

power and energy developed at Corps of Engineer projects in the southeastern states, markets the entire commercial output of the Allatoona plant through the facilities of the Georgia Power Company.

The main dam extending across the river channel consists of a curved concrete gravity structure with a gated spillway section. Its overall length is 1,250 feet and the maximum height above the channel to top of dam at elevation 880 feet is 190 feet. Rolled earthfill saddle dikes on the left bank have a total length of 4,045 feet. The powerhouse is on the left bank below the dam and the switchyard and transformer substation occupy the space between the dam and the powerhouse. The reservoir has a total storage capacity of 671,000 acre-feet at pool elevation 860 feet. Of this amount, 303,420 acre-feet are reserved for controlling flood flows, and 284,580 acre-feet between elevations 840 and 800 are for power storage. The dead storage pool, with top elevation at 800 feet, contains a volume of 83,000 acre-feet.

V. *Affected Downstream Projects*

The construction of new projects and modification of existing projects by the Alabama Power Company on the Coosa River are to continue until 1968 and, therefore, the period covered by this study has been limited to the Company projects completed and in operation at the end of calendar year 1963. The Weiss reservoir began filling in the spring of 1961 and the project was completed in 1962. The next development completed under Project No. 2146 is the Logan Martin project, which was in operation by the end of calendar year 1964.

Four operating hydroelectric projects on the Coosa River belonging to the Alabama Power Company were affected by flow regulation at the Allatoona project during the 1961-63 period. A brief description of these projects, all in Alabama, follows in downstream order.

[1177]

a. *Weiss Dam.* The Weiss project, with a drainage area of 5,273 square miles, is located on the Coosa River approximately 32 miles upstream from Gadsden, Alabama, and 130 miles below Allatoona. Construction of the project was begun in 1958 and completed in 1962. The project has a total installation of 87,750 kilowatts in three units of equal size. Two units were placed in commercial operation on June 5, 1961, and the third unit on July 5, 1962. The average operating head at full load is about 43 feet.

The dam consists of a concrete gated spillway section with compacted-earth abutment dikes. A diversion canal from the dam is approximately 4 miles long, being constructed across a 20-mile bend of the river, with the power plant at the lower end of the canal. The reservoir at full power pool, elevation 564, extends to the Federal Mayo's Bar Lock and Dam, which is inoperative and no longer maintained. The license provides for a 6-foot power drawdown from elevation 564 to elevation 558. A capacity table furnished by the Company shows the volume of storage space in this zone of the reservoir to be 148,000 acre-feet. Storage capacity of approximately 378,000 acre-feet between elevation 572 and elevation 564 is provided for the control of floods.

b. *Lay Dam.* Lay Dam has a drainage area of 9,170 square miles. It is 51 miles above the mouth of the Coosa River, 14 miles above Mitchell Dam, 24 miles southwest of Childersburg, Alabama, and about 160 miles downstream from the Weiss development. This project was constructed under War Department permits prior to enactment of the Federal Water Power Act of January 10, 1920, and placed in operation in 1914. It was licensed by the Commission under Project No. 2146 in 1957. It consists of a concrete gravity structure with a gated spillway section 1,543 feet long overall with a height of 104 feet to top of piers. The spillway has 26 gates. Full power pool is at elevation 382 and usable storage in the 7-foot maximum drawdown is

37,400 acre-feet. The power installation at the dam consists of six units with nameplate ratings totaling 64,800 kilowatts at 0.8 power factor operating under an average power head of 69 feet. However, the plant is being operated at unity power factor with an output of about 81,000 kilowatts.

c. *Mitchell Dam.* Mitchell Dam, with a drainage area of 9,810 square miles, is 37 miles above the mouth of the Coosa River and 19 miles above Jordan Dam. This project, completed in 1923, was constructed by the Alabama Power Company under project license No. 82, issued by the Federal Power Commission on June 27, 1921. It consists of a concrete gravity section with a gated spillway section 1,264 feet long overall and 106 feet high to top of piers. The spillway has 26 gates with a total length of 930 feet. There are also

[1178]

five additional ungated spillway bays with a total length of 180 feet. Usable storage in the 6-foot drawdown below maximum power pool, elevation 312, is 33,300 acre-feet. The power installation consists of four units with nameplate ratings totaling 72,500 kilowatts operating under an average power head of 66 feet.

d. *Jordan Dam.* Jordan Dam, with a drainage area of 10,145 square miles, is 18 miles above the mouth of the Coosa River. This project, completed in 1929, was constructed by the Alabama Power Company under project license No. 618, issued by the Federal Power Commission on November 7, 1925. It consists of a concrete gravity dam having a curved axis with a spillway section 1,330 feet long. The height to top of piers is 125 feet. The spillway has 35 bays. At the left bank end 17 bays have vertical lift gates, while 18 bays adjacent to these and toward the center of the dam are ungated. Usable storage in the 10-foot maximum drawdown below full power pool, elevation 245, is 43,750 acre-feet. The power installation at the dam

[1178]

consists of four units totaling 100,000 kilowatts operating under an average power head of 90 feet.

VI. *Method of Computing Payments for Headwater Benefits*

Payments made by the Alabama Power Company for Allatoona headwater benefits for the period 1950 through 1960 were based on a method of computation which became known as the Allatoona formula. When it became apparent that headwater-benefit studies would eventually be made throughout the country in basins involving varying physical conditions and types of development, the Commission, after careful study of the factors involved, established procedures for use in computing headwater benefits.

On April 23, 1963, the Commission issued Order No. 268 in Docket No. R-221 amending Part 11 of Subchapter B of the Regulations under the Federal Power Act. This amendment, which became effective June 1, 1963, provides procedures to be used in computing annual billings for headwater benefits.

Section 11.27(a) of the Regulations provides a method of computation to be used when owners of downstream power developments have assurance of scheduled water releases from an upstream storage reservoir and when the principal benefits to the downstream plant result from the release of upstream power storage during the critical period.

Section 11.27(b) of the Regulations provides that whenever ". . . the principal power benefits from streamflow regulation are derived from storage other than power storage, or the owners of downstream

[1179]

power developments do not have assurance of scheduled storage releases, then the portion of the average annual cost of interest, maintenance, and depreciation on the joint-use facilities of each headwater improvement to be borne by

power, both at site and downstream, is to be equitably apportioned among the power plants benefited, and the annual cost thus apportioned to each downstream power plant shall be the annual billing to be made for headwater benefits."

Staff studies indicate that billings for the years 1961, 1962, and 1963 should be made in accordance with Section 11.27(b) of the Regulations. However, actual instead of average annual costs should be used because of the changes in basin development which occurred during the period. Additional changes occurred in 1964 and changes are scheduled for succeeding years. It is anticipated, therefore, future billings will be computed on an annual basis until all projects are completed, after which an average annual charge should be computed.

Accordingly, for the purpose of this investigation, the annual cost of interest, maintenance, and depreciation on the joint-use facilities to be borne by power at Allatoona—Section 10(f) costs—have been apportioned according to the annual monetary value of the at-site power and of the gains received at the downstream plants of the Alabama Power Company. Hence, the payment to be made to the United States for benefits received by each plant from Allatoona is determined by the following formula:

$$P_n = C_p \frac{V_n}{V_f + V_d}$$

in which P_n = annual 10(f) costs of the Allatoona Dam and

in which P_n = annual payment to be made for headwater benefits received at a downstream non-federal plant (or group of plants),

C_p = annual 10(f) costs of the Allatoona Dam and reservoir to be borne by power both at site and downstream,

[1179]

V_n = net annual monetary value of benefits received at a downstream non-federal plant (or group of plants),

V_f = annual monetary value of the Federal headwater improvement to at-site power production, and

V_d = net annual monetary value of benefits received at all downstream plants.

VII. *Data Furnished for Study of Energy Benefits*

Basic data for this study were obtained from the Corps of Engineers, Mobile, Alabama, and from the Alabama Power Company.

[1180]

The daily reservoir regulation at Allatoona, in day-second-feet, and the midnight pool elevations were furnished by the Corps of Engineers. A sample sheet of the data furnished is shown in Table 1.

Information furnished on a daily basis by the Alabama Power Company for the Weiss, Lay, Mitchell, and Jordan plants includes the gross generation in megawatt-hours, the turbine and spillway discharges in day-second-feet, and the average 24-hour forebay and tailwater elevations. Forebay and tailwater elevations are the average of 24 hourly readings.

VIII. *Estimated Energy Gains at Downstream Plants Attributable to the Allatoona Project*

The energy gains at the downstream plants attributable to upstream reservoir storage are represented by the difference between the actual generation at the downstream plants with storage regulation and the generation without such regulation. Preliminary to determining this difference in generation, it was established from flow records that water released from the Allatoona reservoir requires about three days to reach

Lay, Mitchell, and Jordan. This time of travel was used in our past studies. Accordingly, changes in storage at the Allatoona reservoir were lagged three days when estimating the effect of this regulation on flows at Lay, Mitchell, and Jordan.

This headwater benefit study finds an additional Company project, the Weiss reservoir project, constructed downstream from Allatoona since the last investigation period. It is located between the Allatoona Dam and the Lay plant. Flow records indicate the travel time to be one day for storage releases from Allatoona to reach the new Weiss project, and two days for Weiss releases to reach Lay, Mitchell, and Jordan.

Previous staff investigations, based on the analysis of plant log sheets furnished by the Company, established nominal hydraulic capacities of the turbines at Lay, Mitchell, and Jordan to be 17,850 cfs, 16,600 cfs, and 19,600 cfs, respectively. Since there has been no change in plant conditions, these capacities represent the nominal total turbine flow at these developments.

The Weiss plant operated with two units from June 5, 1961, when it started commercial operation, through July 4, 1962, and its full complement of three units began operation on July 5, 1962. An analysis of plant operations indicates that it has a hydraulic capacity of 18,000 cfs with two units operating and 27,000 cfs with three units when the maximum power pool is not exceeded.

a. *Benefits at Weiss.* The Weiss reservoir, as well as the Allatoona project, provides regulation for the Company's downstream

[1181]

plants. Although Allatoona regulates about 20 percent of the total drainage area of the Weiss project, 1,100 square miles against 5,273 square miles, it provides about 33 percent more power storage in an average water year and 110 percent more in the critical period. Under the Company rule curve, Plate 3, 6 feet of power storage at Weiss provide

148,000 acre-feet for annual regulation, while at Allatoona the annual power storage regulation amounts to a volume of 186,500 acre-feet between elevations 840 and 820.

The hydrologic cycle in the Southeastern part of the United States, and particularly in the Coosa River basin area, shows the predominant rainfall period to be in the first half of the year, when both reservoirs are filling according to rule curve regulation, while the remainder of the year can be relatively dry.

Releases of water from Allatoona normally are made in accordance with the Allatoona rule curve unless rainfall above normal occurs to provide a runoff volume downstream that may require storage and necessitate operation above the rule curve. Plate 4 shows Allatoona reservoir elevations based on a plotting of controlling points for the three years of study. Coupled with the Company's ability to regulate with Weiss power storage, the conditions provide a flexibility resulting in a more convenient as well as a more advantageous power operation, particularly in the last six months of the year when a minimum volume of flow of about 186,000 acre-feet from Allatoona storage can be anticipated in the average year. To accomplish this same result without the existence of Allatoona would have required additional investment by the Company in providing alternative storage. Based on these considerations, all regulated water from Allatoona used in power generation is considered a tangible benefit to the Weiss plant as well as to the other three downstream Company plants.

Filling of the Weiss reservoir began on March 28, 1961, when the gates were closed. A study of the records indicates that from the time the Weiss reservoir began filling to June 5, 1961, when the hydroelectric plant was placed in commercial operation all water stored in the reservoir was obtained from runoff from the drainage area between the Allatoona and Weiss projects.

b. *Procedures For Estimating Energy Gains at Weiss.* Energy gains at Weiss were computed on a daily basis assuming Allatoona water being used through the turbines upon its arrival at the plant, taking into account travel time, even though it may have been stored for later use. Energy gains or losses were computed by multiplying the Allatoona daily additions to, or reductions in, usable flow at Weiss by the kwh-per-dsf factor for that day, as determined from actual gross generation and turbine-use records. In these computations it was assumed that the ratio of the daily energy output to the flow through the turbines at

[1182]

Weiss would have been the same for any particular day with or without Allatoona regulation. On days when storage is being released from Allatoona and spilling is not occurring at Weiss, all such Allatoona water is considered beneficial to the plants. If water is being spilled, the beneficial storage release used through the turbines is the storage release minus the spill. On days when water is being stored at Allatoona such storage is considered a negative benefit to Weiss up to an amount not exceeding the difference between the flow through the turbines and the hydraulic capacity of the plant generating equipment, provided the Weiss reservoir surface is not above rule curve elevation. If the Weiss plant is operating above the rule curve, operating rules call for utilization of the full water capacity of the turbines. See Plate 3, operating instruction number 3. Therefore, water stored at Allatoona under these conditions could not be utilized and negative benefits are not credited. Also, negative benefits are not credited if Weiss project is spilling for flood control operation since it is assumed that if the stored water had been released it would only increase the spill by that amount. Table 6 shows a typical energy gains computation for the Weiss plant.

c. *Energy Gains at Weiss.* Estimates of monthly energy gains at Weiss attributable to Allatoona regulation for the

[1182]

period beginning with the day commercial operation began, June 5, 1961, to the end of 1963 are tabulated in Table 7. The total energy gains for this period are computed to be 35,989,449 kilowatt-hours.

d. *Energy Gains at Lay, Mitchell, and Jordan.* In computing energy gains at Lay, Mitchell, and Jordan it was assumed that each day-second-foot of water passing through a plant on any given day would produce equal amounts of energy. Previous investigations at these plants have been made on a basis of "comparative efficiency" showing the effect of plant operation with and without Allatoona regulated water. "Comparative efficiency" factors for Lay, Mitchell, and Jordan, were derived from data contained in the Company's plant log sheets for various flows used in generation at each plant. The factors were obtained by dividing the generation by the head and turbine discharge. In using this method a comparison is made of the efficiency when using a flow that includes Allatoona regulation with the efficiency when using a flow without Allatoona regulation. By multiplying the water-use by the head and "comparative efficiency" factor the energy was computed for a specific water volume. A study of the ten years of prior investigations has shown that there is insufficient variation when comparing those results with the method of equal energy from each dsf of daily generation to warrant the additional work required by the use of "comparative efficiency" factors.

[1183]

e. *Procedures for Determining Energy Gains at Lay, Mitchell, and Jordan.* The method of determining benefits at these plants for this investigation differ somewhat from the previous investigations since upstream regulation is now provided by both Allatoona and Weiss. (Refer to Tables 8 through 10 in the following discussion for typical energy-gain computations for the Lay, Mitchell, and Jordan plants.) In general, the energy benefits at the downstream plants

were determined by procedures similar to those used at the Weiss project. Each reservoir (Allatoona and Weiss) was credited with attributable benefits resulting from its specific storage regulation as long as the hydraulic capacity of a downstream plant was not exceeded and no water was spilled. (See examples of May 16, 25, and 31, 1963, at Lay Dam). However, under certain flow conditions, when the hydraulic capacity of a plant is exceeded, the benefits have been apportioned on the basis of the total volume of daily regulation at both reservoirs. In cases when both reservoirs are storing and the hydraulic capacity of a downstream plant would have been exceeded had the water not been stored, then negative benefits at each downstream plant are apportioned to each reservoir. This apportionment is determined by multiplying the difference between the hydraulic capacity of a plant and the actual flow at the plant by the ratio of the amount stored at each reservoir to the total of the amount stored at both reservoirs. There are no negative benefits if the downstream plant is spilling or if the turbine flow is at or exceeds the assumed hydraulic capacity, but under these conditions there could be positive benefits since released regulated water could be going through the wheels. As in the examples of May 13, 1963, at Jordan Dam and May 17, 1963, at Mitchell Dam, Weiss is not credited with negative benefits but releases from Allatoona are being used to produce energy.

f. *Energy Gains at Lay, Mitchell, and Jordan.* Estimates of the monthly energy gains at Lay, Mitchell, and Jordan, attributable to Allatoona regulation, for the years 1961, 1962, and 1963, are shown in Table 11. The total energy gains for the three-year period were computed to be 168,-634,692 kilowatt-hours.

g. *Summary of Energy Gains at Company Plants.* The following tabulation summarizes the estimates of energy gains at the Weiss, Lay, Mitchell, and Jordan plants, attributable to Allatoona regulation.

[1183]

Energy Gains at Company Plants in Kwh

Plant	1961	1962	1963	Total
Weiss	6,224,694[1]	12,918,236	16,846,519	35,989,449
Lay	14,015,935	17,139,417	22,931,432	54,086,784
Mitchell	11,342,862	14,132,613	21,863,652	47,339,127
Jordan	16,895,847	21,330,941	28,981,993	67,208,781
Total	48,479,338	65,521,207	90,623,596	204,624,141

[1] June 5 – December 31.

[1184]

IX. *Capacity Gains at Downstream Plants Attributable to the Allatoona Project*

The Alabama Power Company operates in an integrated system known as the Southern Company System. The Companies comprising this operating system are the Alabama Power Company, the Georgia Power Company, the Gulf Power Company, the Mississippi Power Company, and the Southern Electric Generating Company. Only the Alabama Power Company and the Georgia Power Company operate hydroelectric plants in the Southern Company System.

As mentioned in Section V, the Alabama Power Company added the Weiss reservoir project on the Coosa River to its system in June 1961, which, in addition to pondage at Lay, Mitchell, and Jordan, provides regulation for its plants downstream from the Allatoona project.

Water supply records show that runoff in the Coosa River basin was above average during 1961, 1962, and 1963. Thus, this period does not represent a critical period for the basin.

The dependable capacity of the Alabama Power Company's Coosa River plants for the period of this investigation was based on the system loads and load duration curves of the

Southern Company System. Loading was done with and without the effect of Allatoona storage on the downstream Coosa River plants using the Southern Company's system critical period of July-December 1931. Under these conditions, staff studies indicate the Company's Coosa River hydroelectric plants would be fully dependable on the load in 1961, 1962, and 1963 with or without regulation by Allatoona reservoir. It is concluded, therefore, that there were no capacity gains, or losses, at downstream plants attributable to the Allatoona project during these years.

X. *Incremental Downstream Project Costs Associated with Energy Gains*

The incremental costs associated with the production of energy gains at the four downstream hydroelectric plants resulting from regulation at Allatoona are those costs incurred which are attributable to and directly proportional to increases in generation at these plants. Such incremental costs include plant maintenance, State generation taxes, and the incremental cost of license fees.

a. *Incremental Maintenance Costs.* Incremental maintenance cost data for the four Company plants were obtained from the Utility's reports on FPC Forms No. 1. Supplemental data were also furnished by the Company. The only costs considered to be substantially proportionate to added generation are those listed as FPC Account No. 544,,

[1185]

maintenance of electric plants; and FPC Account No. 545, maintenance of miscellaneous hydraulic plant. To these costs were added a pro rata share of FPC Account No. 541, maintenance supervision and engineering. In 1961 these accounts were not included in Forms No. 1 but the Alabama Power Company furnished the information by letter. On this basis, the average incremental cost of maintenance was computed to be 0.072, 0.063, and 0.064 mills per kilowatt-

hour, respectively, for the years 1961, 1962, and 1963. (See Table 12).

b. *Taxes.* The State of Alabama imposes a tax of 0.40 mill per kilowatt-hour on hydroelectric energy generated in Alabama and sold only within the State. Thus, there is an incremental cost to the Company for energy gains at the four hydroelectric plants, to the extent that such energy is used within the State, that would not be incurred if the equivalent generation were obtained from the Company's steam-electric system. Based upon proportion of hydroelectric generation used within the State, the generation tax applicable to the Weiss, Lay, Mitchell, and Jordan plants is 0.268, 0.266, and 0.296 mills per kilowatt-hour, respectively, for the years 1961, 1962, and 1963.

c. *License Charge for Energy Generated.* An additional incremental cost of generation is the charge for the purpose of reimbursing the United States for the costs of administration of Part I of the Federal Power Act. For the period covered by this investigation an incremental charge of 0.025 mills per kilowatt-hour was in effect.

d. *Total Incremental Costs.* The total incremental costs associated with energy gains at the Weiss, Lay, Mitchell, and Jordan plants are summarized below.

	Incremental Costs at Downstream Plants (mills per kwh)		
Item	1961	1962	1963
Maintenance	0.072	0.063	0.064
State Generation Tax	0.268	0.266	0.296
License Charge	0.025	0.025	0.025
Total	0.365	0.354	0.385

XI. *Estimated Monetary Value of Energy Gains*

If the additional energy at the Company's downstream plants resulting from Allatoona regulation had not been available, it would have been necessary to supply equivalent energy from some plant or

[1186]

plants in the Company's steam-electric system. It follows, therefore, that the net monetary value of the energy gains would be the difference between the higher incremental cost of producing steam-electric energy and the lesser incremental cost of generating equivalent energy at the Company's four hydro plants. It is assumed that the alternative source would be a plant having the lowest incremental cost of energy production and having unused capacity to permit generating the required energy. In the area in which the four hydro plants operate there are three steam-electric plants which are representative of such an alternative energy source and which operate at plant factors which would enable them to supply the alternative energy. These are the Gadsden 1 and 2 and the Gorgas No. 2 and No. 3 plants. (See Plate 1 for location of steam plants.)

a. *Incremental Cost of Producing Steam-electric Energy.* Representative incremental annual production expenses for the alternative steam-electric energy source is based on an average of the three plants named above. The data for determining the incremental costs are taken from FPC Forms No. 1. The expenses used in determining the incremental cost of the alternative energy are 90 percent of the total fuel cost, FPC Account No. 501; maintenance of boiler plant equipment, FPC Account No. 512; maintenance of electric plant, FPC Account No. 513; maintenance of miscellaneous steam plant, FPC Account No. 514; and a pro rata share of maintenance supervision and engineering, FPC Account No. 510. Prior to 1962 these accounts were not furnished in the Company's Form No. 1. For the year 1961,

therefore, the incremental cost of the alternative energy was based on the method used in prior investigations of headwater benefits in the Coosa River basin. This consisted of using 90 percent of the total fuel cost and 30 percent of the total production expenses (operation and maintenance costs) exclusive of fuel cost.

Table 13, sheets 1 and 2, shows the data used in obtaining the incremental cost of producing the alternative steam-electric energy, and the computed cost to be 2.522, 2.551, and 2.571 miles per kilowatt-hour, respectively, for the years 1961, 1962, and 1963.

b. *Net Unit Value of Energy Gains.* The net unit value of the energy gains to the Company for each year is the difference between the unit incremental cost of steam-electric energy shown above and the unit incremental cost associated with the hydro energy gains. The net unit values of the energy gains for each year are shown below.

	Net Unit Value (mills per kwh)		
Item	1961	1962	1963
Steam-Electric Incremental Energy Cost	2.522	2.511	2.571
Hydro Incremental Energy Cost	0.365	0.354	0.385
Net Value of Added Hydro Energy	2,157	2.157	2.186

[1187]

c. *Total Net Value of Energy Gains.* The total annual net value of the energy gains, V_n in the apportionment formula, at Weiss, Lay, Mitchell, and Jordan, shown in the following tabulation, were obtained by applying the above net unit monetary values to the energy gains resulting from Allatoona regulation.

Net Monetary Value of Energy Gains
at Company's Hydro Plants

Year	Energy Gains (kwh)	Net Monetary Value (mills per kwh)	Net Monetary Value (dollars)
1961	48,479,338	2.157	104,570
1962	65,521,207	2.157	141,329
1963	90,623,596	2.186	198,103
Total	204,624,141		444,002

XII. *Costs of the Headwater Improvement*

Annual costs of the Allatoona project, investment costs, and operation and maintenance costs, were provided by the Mobile District of the Corps of Engineers.

a. *Investment Costs.* The investment costs were furnished by letter dated June 25, 1964, for each facility by fiscal years ending on June 30 and are tabulated below.

Investment Costs of the Allatoona Project

Type of Facility	1961	1962	1963
Specific Power	$ 9,266,682	$ 9,266,682	$ 9,266,682
Specific Flood Control	70,287	69,917	69,535
Public-use	514,497	637,688	786,909
Joint-use	23,173,512	23,163,592	23,181,145
Total	$ 33,024,978	$ 33,137,879	$ 33,304,271

Specific power facilities serve the purpose of at-site power only. They include the powerhouse and equipment, power intake works, tailrace, and the switchyard structures and equipment. Specific flood control facilities are those facilities which serve the purpose of flood control only. The

[1187]

recreational area and its facilities at Allatoona comprise the public-use facilities. Joint-use facilities serve more than one project purpose. At Allatoona the dam and reservoir are the principal joint-use facilities and they serve the primary purposes of flood control and power.

[1188]

The Allatoona specific power, specific flood control, and public-use facilities do not affect the power production at the downstream hydroelectric plants of the Alabama Power Company. Therefore, only the joint-use facilities at Allatoona constitute the headwater improvement which provides benefits to the downstream plants.

b. *Apportionment of Joint-Use Investment Costs to Power.* Joint-use costs of the Allatoona project have been allocated by the Corps of Engineers using the Separable Costs-Remaining Benefits method, as shown in the Corps' Cost Allocation Studies dated February 1956, Table 9. Item 5e shows the allocation of the joint-use construction costs in the proportion of 31.10 percent to flood control and 68.90 percent to power. The amounts for interest during construction for flood control and power were taken from the Corps' cost allocation report and are, respectively, $326,200 and $670,100. Accordingly, the joint-use investment, including interest during construction, allocated to power for each year follows.

Allocation of Investment to Power

Year	Joint-use Facilities
	$
1961	15,950,199
1962	15,943,364
1963	15,955,458

c. *Annual Costs of Joint-use Power Facilities.* The total annual costs consist of fixed charges on the investment for this facility and the related operation and maintenance costs.

1. *Fixed Charges on the Investment.* The fixed charges consist of interest at 2.50 percent, depreciation at 1.026 percent, an allowance of 0.10 percent for insurance, and an allowance for the cost of interim replacements. The rate for depreciation is based upon a 50-year, 2.50 percent sinking fund. Table 9, Item 3, of the Corps' February 1956 cost allocation report allows an annual amount of $4,800 for interim replacement costs of joint-use facilities allocated to power.

The annual fixed charges on the investment cost of joint-use facilities allocated to power follows.

[1189]

Annual Fixed Charges on Joine-use Investment
Costs Allocated to Power

Item	1961	1962	1963
Interest at 2.50%	$398,755	$398,584	$398,886
Amortization at 1.026%	163,649	163,579	163,703
Insurance at 0.10%	15,950	15,943	15,955
Interim Replacements	4,800	4,800	4,800
Totals	$583,154	$582,906	$583,344

2. *Operation and Maintenance Costs.* Operation and maintenance costs for the Allatoona project are furnished for each calendar year by the Corps. Tables 14, 15, and 16, show the total operating and maintenance costs for the Allatoona project as submitted by the Corps and also the derivation of the total joint-use power operating and maintenance costs applicable to this investigation. The apportionment of Allatoona operation and maintenance costs for the joint-use facilities allocated to power is summarized below.

[1189]

Annual Operation and Maintenance Costs
of Joint-use Facilities Allocated to Power

Item	1961	1962	1963
Operation	$10,699	$44,257	$54,605
Maintenance	51,172	23,466	30,167
Totals	$61,871	$67,723	$84,772

XIII. *Monetary Value of At-site Power Produced at the Headwater Improvement*

The annual value to the United States of the at-site power produced at the Allatoona project is considered to be equal to the total annual power costs. The components making up the total annual power costs are the annual costs of specific power facilities and the annual costs of the joint-use facilities to be borne by power. Specific power facilities are of value to the at-site plant only, whereas joint-use facilities provide benefits both at site and downstream. Hence, the total annual costs consisting of the annual fixed charges and the operation and maintenance costs on the joint-use facilities allocated to power represent the value of the headwater improvement

[1190]

to at-site power to be used in the formula for apportioning the charges of interest, depreciation, and maintenance on the joint-use facilities. The total annual values to at-site power, V_f in the apportionment formula, are shown below.

Item	1961	1962	1963
Annual Fixed Charges	$583,154	$582,906	$583,344
Operation and Maintenance Costs	61,871	67,723	84,772
Totals	$645,025	$650,629	$668,116

XIV. *Annual Costs to be Apportioned Under Section 10(f) of the Federal Power Act*

Section 10(f) of the Federal Power Act requires that whenever power projects are directly benefited by an upstream reservoir belonging to the United States, the owners of such projects shall reimburse the United States for such part of the annual charges for interest, depreciation, and maintenance on the headwater improvement as the Commission may deem equitable. Such annual charges, C_p in the apportionment formula, for each year of the investigation, are as follows.

	Annual 10(f) Charges		
Item	1961	1962	1963
Interest	$398,755	$398,584	$398,886
Depreciation	163,649	163,579	163,703
Maintenance	51,172	23,466	30,167
Totals	$613,576	$585,629	$592,756

XV. *Computation of Payment for Headwater Benefits*

The computations for apportioning the annual charges for interest, depreciation, and maintenance on the Allatoona project to the Company's Weiss, Lay, Mitchell, and Jordan plants by applying the formula in Section VI are shown below for each year.

The Weiss plant began commercial operation on June 5, 1961; therefore, only that part of the interest, depreciation, and maintenance at Allatoona applying to the remainder of the year should be borne by this plant. Therefore, for June 5, through December 31, 1961, these costs, as well as the other annual charges at Allatoona, are 210/365 of the reported 1961 annual costs.

Rev. 4/9/65

[1191]

Components in Formula

Item	1/1-6/4/61[1] $	6/5-12/31/61[2] $	1962 $	1963 $
C_p	260,560	353,016	585,629	592,756
V_n	30,558[3]	74,012[4]	141,329	198,103
V_f	273,915	371,110	650,629	668,116
V_d	30,558	74,012	141,329	198,103

Applying the components to the formula the payments are computed as follows.

Payment for 1961

1/1 - 6/4: Lay, Mitchell, and Jordan

$$P_n = (260,560)\ \frac{30,558}{273,915 + 30,558} = \$26,151$$

6/5 - 12/31: Weiss, Lay, Mitchell, and Jordan

$$P_n = (353,016)\ \frac{74,012}{371,110 + 74,012} = \$58,697$$

Total for four plants $84,848

Payment for 1962

Four plants:

$$P_n = (585,629)\frac{141,329}{650,629 + 141,329} = \$104,508$$

Payment for 1963

Four plants:

$$P_n = (592,756)\ \frac{198,103}{668,116 + 198,103} = \$135,562$$

Total payment for 1961-63 $324,918

1/ Lay, Mitchell, and Jordan only generating during this period - 155 days.
2/ All four plants operating during this period - 210 days.
3/ 14,166,760 kwh during period at Lay, Mitchell, and Jordan. At 2.157 mills/kwh = $30,558.
4/ 6,224,694 kwh at Weiss plus 28,087,884 kwh at Lay, Mitchell, and Jordan. At 2.157 mills/kwh = $74,012.

[1192]

XVI. *Cost of Investigation*

Section 10(f) of the Federal Power Act requires owners of projects benefiting from headwater improvements to reimburse the United States for the cost of making headwater benefits determinations. Salaries and other expenses incurred to date by the Commission in connection with this study amount to $17,280.

XVII. *Conclusions and Recommendations*

a. *Conclusions.* Based on this investigation of headwater benefits in the Coosa River basin, the staff concludes that:

1. The Alabama Power Company's plants downstream of the Federal Allatoona reservoir project are directly benefited by the latter's regulation.

2. The Company's Weiss reservoir development, downstream from Allatoona, also provides regulation benefits to the Utility's downstream Lay, Mitchell, and Jordan plants. Weiss regulation ability, therefore, has been given equal consideration with that of Allatoona regulation in determining energy gains at these plants.

3. For the three-year investigation period, 1961 through 1963, the Federal Allatoona project benefited the four downstream plants of the Alabama Power Company by a total of 204,624,141 kilowatt-hours in energy gains. The net monetary value of these energy gains to the Company was $444,-002.

4. No gain in dependable capacity was provided by regulation of the Allatoona reservoir.

5. The apportionment of annual costs of the Allatoona project to be borne by power to the Company's four plants for the period covered by this investigation is $324,918.

b. *Recommendations.* It is recommended that:

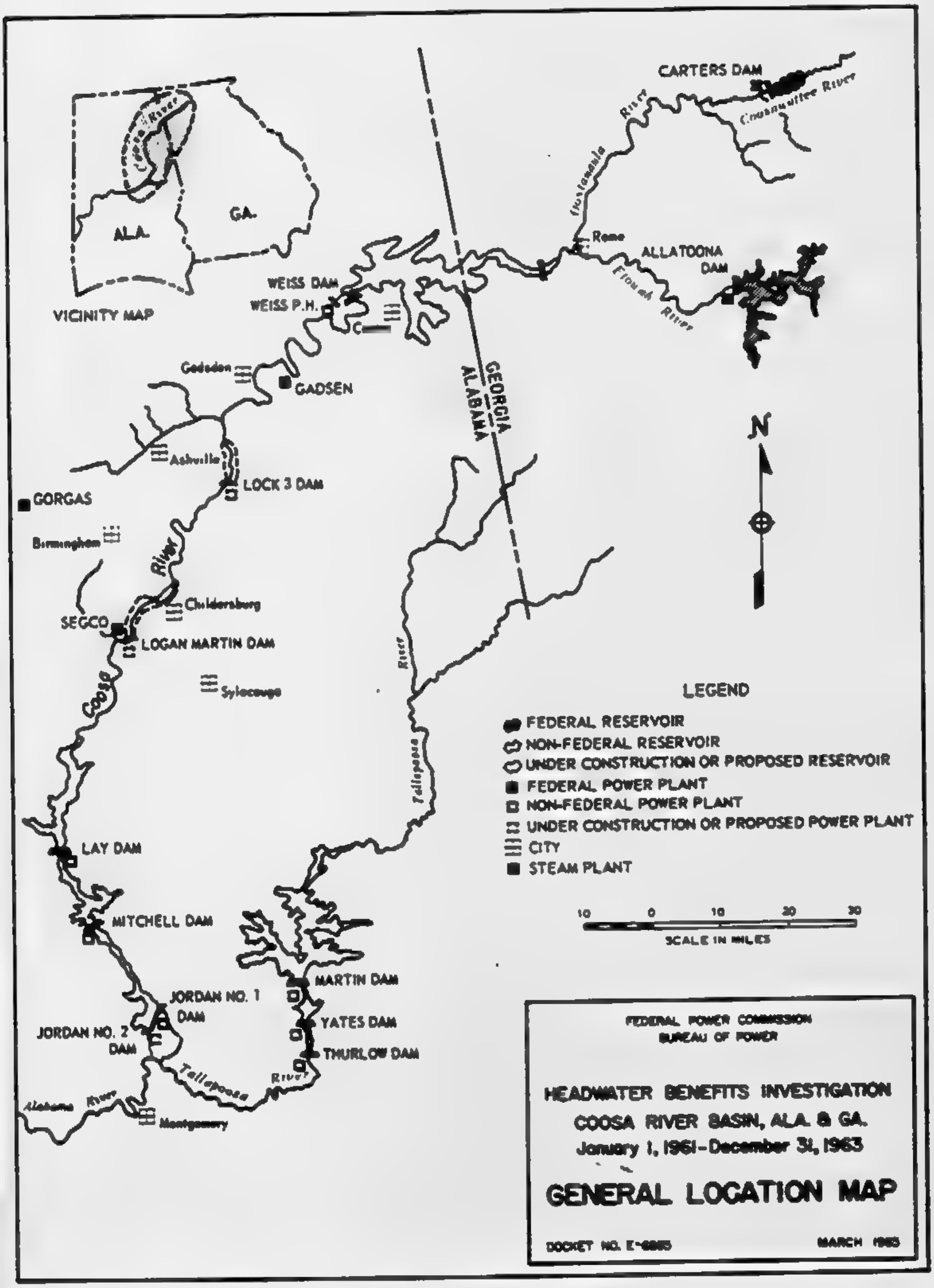
1. The portion of the annual costs to be borne by power, of interest, maintenance, and depreciation on the

Allatoona reservoir project to be paid by the Alabama Power Company for the years 1961, 1962, and 1963 be $324,918.

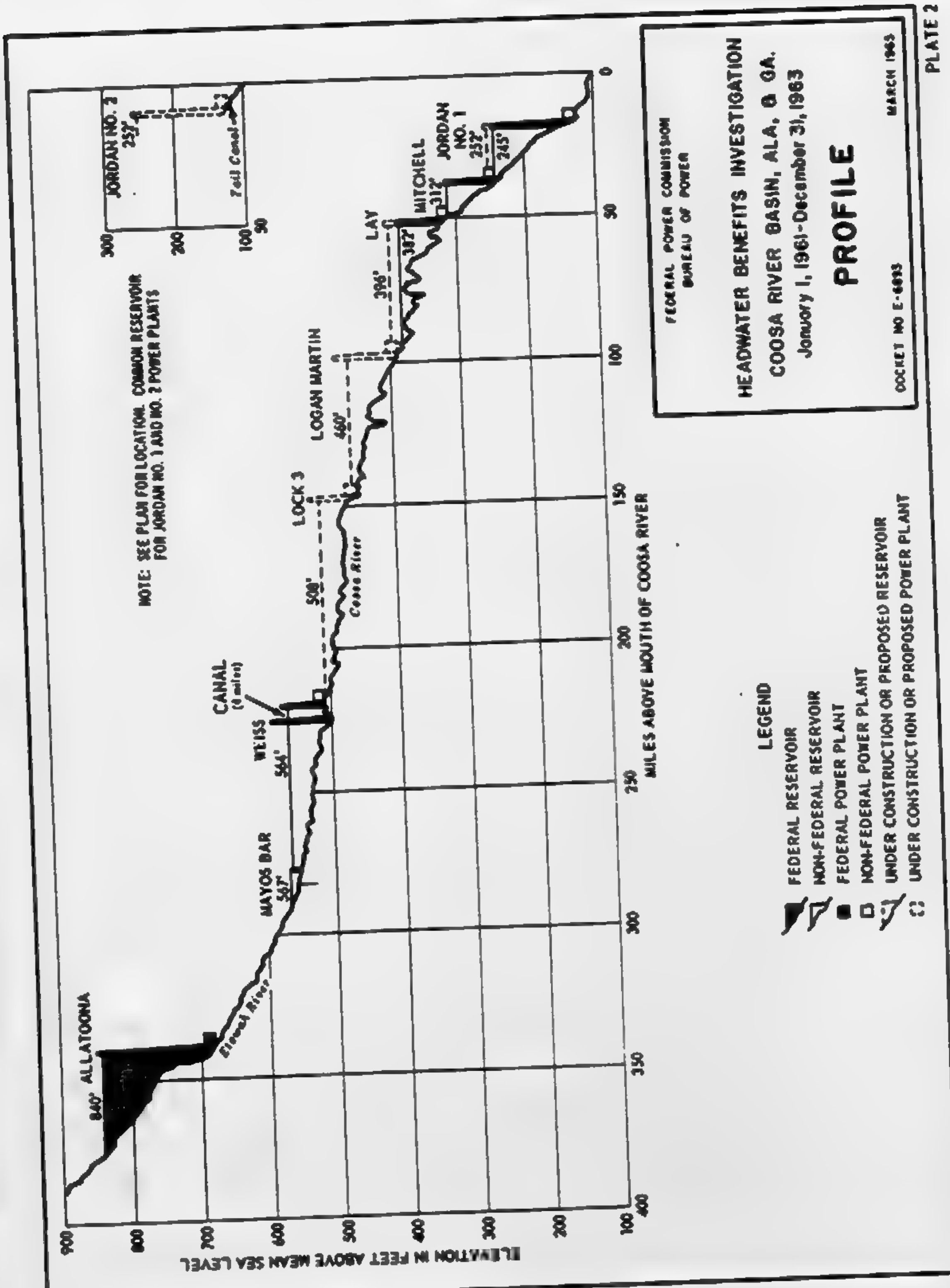
2. In addition to the payment recommended above, the Company be charged for the cost of making this investigation, which cost to date is $17,280.

[1193]

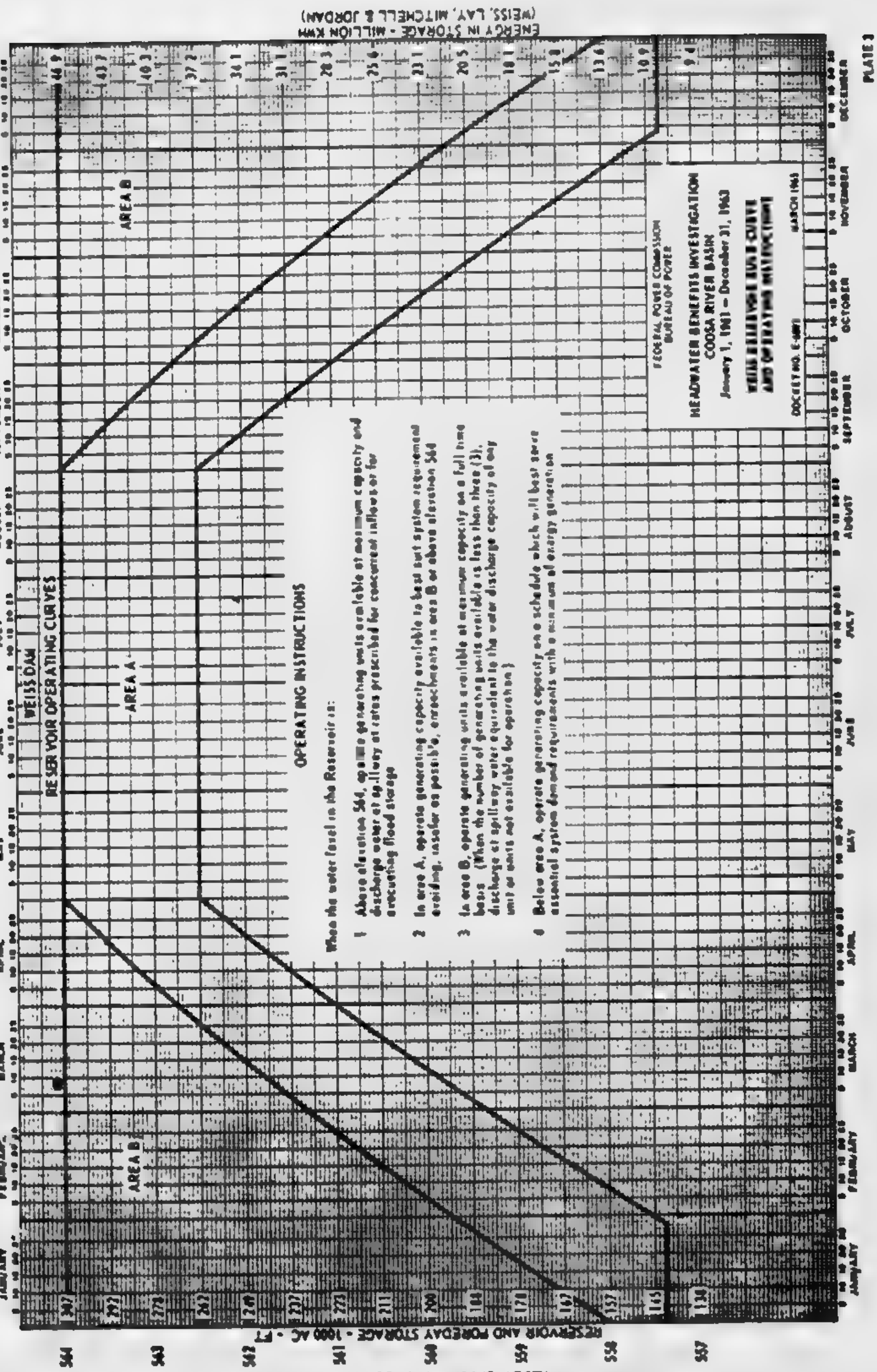
PLATE 1


CARTERS DAM
Coosawattee River
River
Oostanaula
Rome
ALLATOONA DAM
Etowah River
GA.
ALA.
VICINITY MAP
WEISS DAM
WEISS P.H.
GEORGIA
ALABAMA
Gadsden
GADSEN
Ashville
LOCK 3 DAM
GORGAS
Birmingham
River
Childersburg
SEGCO
LOGAN MARTIN DAM
Sylacauga
Coosa
River
Tallapoosa
N
LEGEND
FEDERAL RESERVOIR
NON-FEDERAL RESERVOIR
UNDER CONSTRUCTION OR PROPOSED RESERVOIR
FEDERAL POWER PLANT
NON-FEDERAL POWER PLANT
UNDER CONSTRUCTION OR PROPOSED POWER PLANT
CITY
STEAM PLANT
10 0 10 20 30
SCALE IN MILES
LAY DAM
MITCHELL DAM
MARTIN DAM
JORDAN NO. 1 DAM
JORDAN NO. 2 DAM
YATES DAM
THURLOW DAM
Tallapoosa
River
Alabama River
Montgomery
FEDERAL POWER COMMISSION
BUREAU OF POWER
HEADWATER BENEFITS INVESTIGATION
COOSA RIVER BASIN, ALA. & GA.
January 1, 1961-December 31, 1963
GENERAL LOCATION MAP
DOCKET NO. E-6665
MARCH 1965

[1194]


FEDERAL POWER COMMISSION
BUREAU OF POWER
HEADWATER BENEFITS INVESTIGATION
COOSA RIVER BASIN, ALA. & GA.
January 1, 1961-December 31, 1963
PROFILE
DOCKET NO E-6893
MARCH 1965
PLATE 2
NOTE: SEE PLAN FOR LOCATION. COMMON RESERVOIR FOR JORDAN NO. 1 AND NO. 2 POWER PLANTS
JORDAN NO. 2
252'
Tail Canal
ALLATOONA
840'
Etowah River
MAYOS BAR
507'
WEISS
564'
CANAL
LOCK 3
508'
Coosa River
LOGAN MARTIN
460'
396'
LAY
382'
MITCHELL
312'
JORDAN NO. 1
252'
245'
ELEVATION IN FEET ABOVE MEAN SEA LEVEL
MILES ABOVE MOUTH OF COOSA RIVER
LEGEND
FEDERAL RESERVOIR
NON-FEDERAL RESERVOIR
FEDERAL POWER PLANT
NON-FEDERAL POWER PLANT
UNDER CONSTRUCTION OR PROPOSED RESERVOIR
UNDER CONSTRUCTION OR PROPOSED POWER PLANT

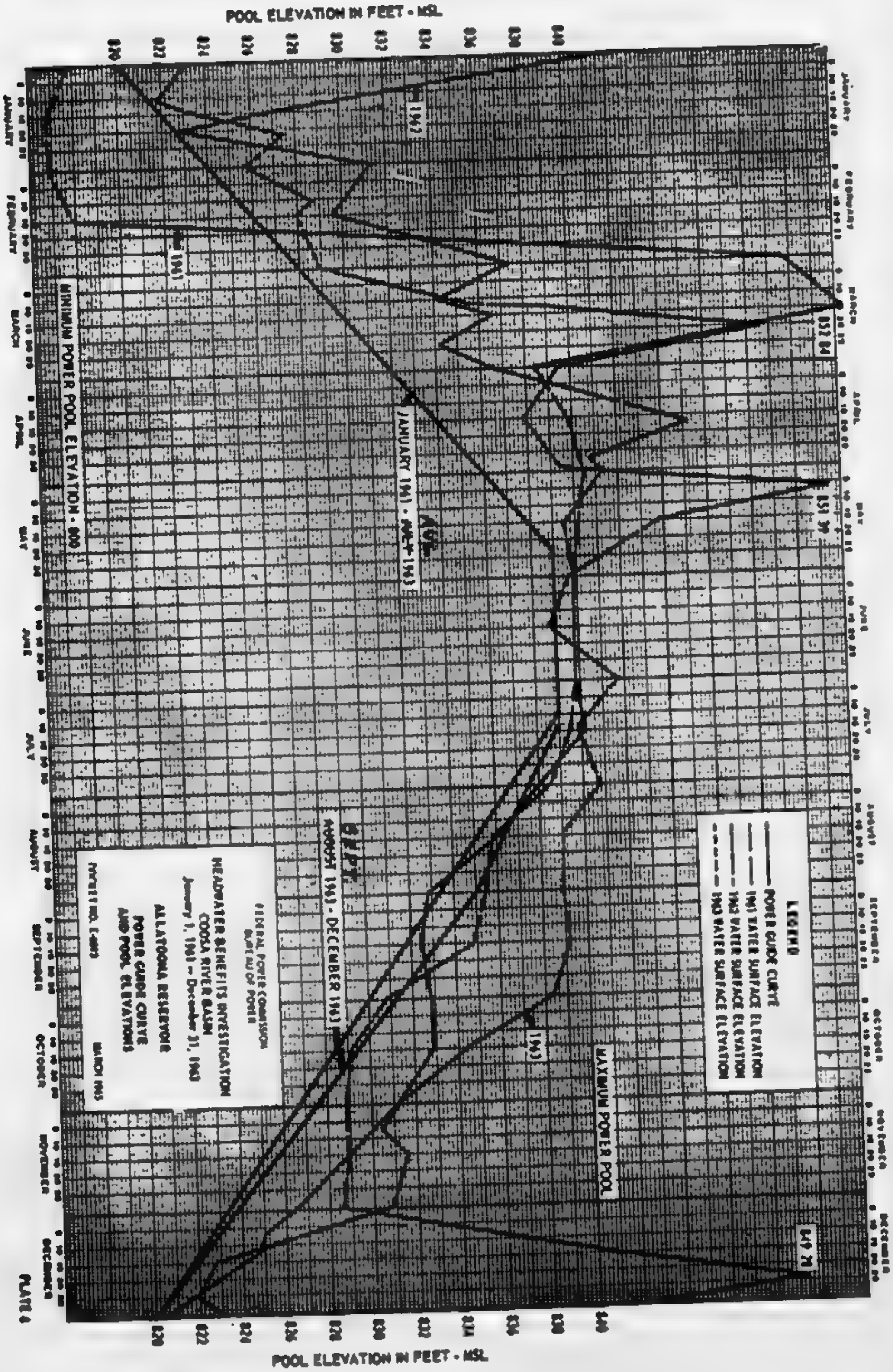
[1195]



WEISS DAM
RESERVOIR OPERATING CURVES
AREA B
AREA A
AREA B
OPERATING INSTRUCTIONS
When the water level in the Reservoir is:
1 Above elevation 564, operate generating units available at maximum capacity and discharge water at spillway at rates prescribed for concurrent inflows or for evacuating flood storage
2 In area A, operate generating capacity available to best suit system requirement avoiding, insofar as possible, encroachments in area B or above elevation 564
3 In area B, operate generating units available at maximum capacity on a full time basis. (When the number of generating units available is less than three (3), discharge at spillway water equivalent to the water discharge capacity of any unit or units not available for operation.)
4 Below area A, operate generating capacity on a schedule which will best serve essential system demand requirements with a minimum of energy generation
FEDERAL POWER COMMISSION
BUREAU OF POWER
HEADWATER BENEFITS INVESTIGATION
COOSA RIVER BASIN
January 1, 1961 – December 31, 1963
DOCKET NO. E-6891
MARCH 1965
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
RESERVOIR EL - FT. ABOVE M.S.L
RESERVOIR AND POREDAY STORAGE - 1000 AC. - FT
564
563
562
561
560
559
558
557
307
292
278
262
249
237
223
211
200
188
178
167
157
145
130
ENERGY IN STORAGE - MILLION KWH
(WEISS, LAY, MITCHELL & JORDAN)
46.9
43.7
40.3
37.2
34.1
31.1
28.3
25.6
23.1
20.5
18.1
15.8
13.6
10.9
9.4
PLATE 3

[1196]

[1196]



POOL ELEVATION IN FEET - MSL
MINIMUM POWER POOL ELEVATION - 800
JANUARY 1961 - JULY 1963
AUGUST 1963 - DECEMBER 1963
MAXIMUM POWER POOL
LEGEND
POWER GUIDE CURVE
1961 WATER SURFACE ELEVATION
1962 WATER SURFACE ELEVATION
1963 WATER SURFACE ELEVATION
FEDERAL POWER COMMISSION
BUREAU OF POWER
HEADWATER BENEFITS INVESTIGATION
COOSA RIVER BASIN
January 1, 1961 – December 31, 1963
ALLATOONA RESERVOIR
POWER GUIDE CURVE
AND POOL ELEVATIONS
MARCH 1965
PLATE 6
POOL ELEVATION IN FEET - MSL

[1215]

Docket No. E-6893 January 1968

ADDENDUM TO

Staff Report on
Investigation of Headwater Benefits
Coosa River Basin
January 1, 1961, through December 31, 1963
March 1965
Revised April 1965

The following revisions have been made to the staff report which, as revised, forms the basis for the Commission's order issued September 28, 1966, requiring payment to be made by the Alabama Power Company to the United States for benefits provided in the Coosa River basin by the Federal Allatoona headwater improvement to the Company's Weiss, Lay, Mitchell, and Jordan plants for the period 1961-1963. The parties were advised of the substance of the revisions at a conference on January 18, 1966, and by letter dated January 27, 1966. The Commission's order shows the payment due the United States to be $296,003. However, subsequent correction of mathematical errors has resulted in that amount being reduced to $294,889.

Page 1. Second paragraph, last line. Strike the figure "$324,-918" and insert the figure "$294,889." Third paragraph, last line. Strike the figure "$17,280" and insert the figure "$27,-107."

Page 2. Section IV, first paragraph, second line. Strike the figure "1,100" and insert the figure "1,110."

Page 3. First full paragraph, line 12. At the end of the sentence, after the word "storage" add", which total power storage is for use during a recurrence of the critical period."

Page 4. Paragraph b, first line. Strike the figure "9,170" and

[1215]

insert the figure "9,087." Paragraph c, first line. Strike the figure "9,810" and insert the figure "9,827."

Page 5. Paragraph d, first line. Strike the figure "10,145" and insert the figure "10,165."

Page 7. Section VIII, first paragraph. In the third line strike the word "storage" and insert the words "stream flow." At the end of the first sentence add "taking into account the purposes and the operating conditions imposed on the plants." Section VIII, second paragraph. In the fifth line before the words "one day" and in the sixth line before the words "two days" add the word "about."

[1216]

Page 8. Second line. Strike the figure "1,100" and insert the figure "1,110." Second full paragraph, second line. After the word "curve" add the words ", or as determined by the Corps,." Subsection b, fourth line. At the end of the sentence add "and provided the rule curve elevation of Area A (see Plate 3) is not exceeded."

Page 9. Second line. Strike remainder of paragraph after the sentence ending with "regulation" and insert the following:

> On days when storage is being released from Allatoona and the pool elevation at Weiss is not above the rule curve of Area A (see Plate 3), all such Allatoona water is considered as used in the generation of energy at the Weiss plant with positive benefits credited to Allatoona. If water is being stored at Allatoona, all such water is assumed to be usable at the Weiss plant with negative benefits to the Company as long as the assumed addition of such water to the Weiss reservoir would not cause it to rise above the rule curve elevation of Area A. Positive energy benefits to Allatoona and negative energy benefits to Weiss are not credited when the Weiss pool is operating above the rule curve of Area A. This criterion was adopted because, with Weiss pool above

Area A, outflow is in accordance with flood-control operations as prescribed in the Weiss Reservoir Regulation Manual prepared by the District Engineer, U.S. Army Engineer District, Mobile, Alabama. The operations prescribed by the Corps require the outflow from the reservoir, when the pool is in Area B (see Plate 3), to be equal to the maximum hydraulic capacity of the three turbines, whether the generating units are in use or not, so as to lower the pool to rule-curve elevation, if possible, by this operation. Should the pool rise above maximum power pool elevation 564, outflow is to be increased in accordance with rules prescribed in the manual. (See Plate 3, operating instructions.) Table 6 shows a typical energy gains computation for the Weiss plant.

Subsection c, last line. Strike the figure "35,989,449" and insert the figure "34,768,433."

Page 10. Subsection e. Strike the remainder of the paragraph after the end of the sentence in line 5 and insert the following:

The energy benefits to the Lay, Mitchell, and Jordan plants are computed in a manner similar to that used at the Weiss project, that is we assumed that each day-second-foot of water, regulated or unregulated, passing through

[1217]

the turbines at each plant on a given day would produce equal amounts of energy. Daily flows adjusted to eliminate the effect of regulation by Weiss are used in the computation of energy gains at Lay, Mitchell, and Jordan attributable to Allatoona regulation. These flows are shown as "Flow w/o Weiss Reg. dsf" in revised Tables 8, 9, and 10, which tables show typical computations of energy gains at the Lay, Mitchell, and Jordan plants for the month of May 1963.

[1217]

The daily "Usable Allatoona Reg. Flow" at each plant (see Tables 8, 9, and 10) used in computing the energy gains at Lay, Mitchell, and Jordan attributable to Allatoona regulation is the total amount of Allatoona daily regulation as long as the hydraulic capacity of the plant would not be exceeded with its use. In a case where Allatoona is releasing stored water and the "Flow w/o Weiss Reg." at a plant exceeds its hydraulic capacity by less than the actual storage released, then the difference between the amount released from Allatoona and the amount that would be spilled at the plant is considered as usable Allatoona regulated flow through the turbines. There are no negative benefits on days when water is stored at Allatoona if the flow at the downstream plant is at, or exceeds, the hydraulic capacity of the plant. Negative benefits, however, have been allowed up to the hydraulic capacity of the plant if the "Flow w/o Weiss Reg." is below this amount and water is being stored at Allatoona.

In determining energy gains, the assumption is made that a turbine is operated, whenever possible, so as to produce the maximum aount of power per cfs. This is accomplished when the turbine is operating at best efficiency (best gate). When turbine flow exceeds that at which best-gate operation can be accomplished, it is assumed that turbines are operated at full gate. The estimated maximum total plant turbine flows with which operation at best gate can be accomplished are shown for each plant in the table below in the column headed "Maximum Best-Gate Flow." The estimated maximum total plant turbine flows for full-gate operation are shown for each plant in the table below in the column headed "Maximum Full-Gate Flow."

In computing the energy gains for any given day the "Usable Allatoona Reg. Flow" is multiplied by the applicable "K" factor (kwh/dsf) which is dependent on

[1218]

the amount of "Flow w/o Weiss Reg." assumed to be passing through the turbines.

Actual daily "K" factors are computed (the day's gross generation is divided by the daily flow through the turbines) and used when:

(1) the actual flow through the turbines and the flow as adjusted to eliminate the effect of regulation by Weiss and water withheld, if any, at Allatoona do not exceed best-gate flow, and

(2) both actual and adjusted flows exceed those for best-gate operation.

Assumed "K" factors associated with the flows shown in the table below, which are based on actual plant operations in past years, are utilized under the following conditions:

(1) when the actual flow (with Weiss regulation) through the turbines is less than or equal to the "Maximum Best-Gate Flow" but the adjusted flow (without Weiss regulation) is greater, than the "K" factor for "Full-Gate" is used, and

(2) when the actual flow through the turbines is greater than "Maximum Best-Gate Flow" but the adjusted flow is less, than the "K" factor for "Best Gate" is used.

Plant	"K" for Best-Gate	Maximum Best-Gate Flow (dsf)	"K" for Full-Gate	Maximum Full-Gate Flow (dsf)
Lay	114	16,000	104	17,850
Mitchell	113	13,500	104	16,600
Jordan	154	16,000	145	19,600

Page 10. Subsection f, last line. Strike the figure "168,634,-692" and insert the figure $158,555,900." Subsection g. Strike all the figures in the tabulation and insert the figures shown in the following tabulation.

[1219]

Energy Gains at Company Plants in Kwh

Plant	1961	1962	1963	Total
Weiss	6,278,870[1]	11,984,601	16,504,962	34,768,433
Lay	13,021,964	17,075,509	22,952,313	53,049,786
Mitchell	9,781,375	13,452,139	20,397,170	43,630,684
Jordan	14,412,080	19,776,692	27,686,658	61,875,430
Total	43,494,289	62,288,941	87,541,103	193,324,333

[1] June 5 – December 31

Page 11. Section IX, fourth paragraph. In line 9 after the sentence ending with "reservoir," add these sentences:

> A study has also been made as to the effect of flood regulation by Allatoona on the Utility's Coosa River plants for the peak load months of June, July, August, and September, using the basin flood of August 1920, which is estimated to have a frequency of about once in 15 years. This study showed that no capacity benefits resulted from regulation of this flood by Allatoona.

Page 12. In the first line, strike the word "plants" and insert "plant." In the second line, strike the word "were" and insert the word "was." In the sixth line strike the words "On this basis, the" and insert the word "The."

Page 13. Subsection a. In the fifth line after "FPC Forms No. 1" add "and from data furnished by the Company." After the first paragraph of subsection a. add the following:

> By letter of May 12, 1966, the Company furnished revised fuel costs for the Gaston plant for each of the three years and these costs are used in revised Table 13.

Subsection a., second paragraph. In the third line strike the figures "2.522, 2.511, and 2.571" and insert the figures "2.424, 2.473, and 2.461" respectively. Subsection b. In the table, strike the figures for the steam-electric incremental energy cost of "2.522, 2.511, and 2.571," and insert the figures "2.424, 2.473, and 2.461," respectively. Strike the figure for the 1963 hydro incremental energy cost of "0.384" and insert the figure "0.385". Strike the figures for the net values of added hydro energy of "2.157, 2.157, and 2.186," and insert the figures "2.059, 2.119, and 2.076," respectively.

[1220]

Page 14. Subsection c. Strike all the figures in the tabulation except the years and insert the figures shown in the following tabulation.

Net Monetary Value of Energy Gains
at Company's Hydro Plants

Year	Energy Gains (kwh)	Net Monetary Value (mills per kwh)	Net Monetary Value (dollars)
1961	43,494,289	2.059	89,555
1962	62,288,941	2.119	131,991
1963	87,541,103	2.076	181,735
Total	193,324,333		403,281

Page 16. Subsection 2. In line 7 after the sentence ending with the word "investigation" add the following sentence. "The costs in Table 14 are revised figures furnished by the Corps in January 1966."

Subsection 2. In the table strike the figures under 1961 of "10,699, 51,172, and 61,871," and insert the figures "44,-769, 21,943, and 66,712," respectively.

Page 17. Table at top of page. Under 1961 strike the operation and maintenance figures of "61,871" and the total of "645,025" and insert the figures "66,712" and "649,866," respectively.

Section XIV. In the table under 1961 strike the maintenance figure of "51,172" and the total of "613,576" and insert "21,943" and "584,347," respectively.

Page 18. The entire page is superseded by page 18, revised November 1967, attached at the end of addendum.

Page 19. Section XVI, last line in paragraph. Strike the figure "$17,280," and insert the figure "$27,107." Section XVII, subsection a.2. Strike the entire paragraph. Subsection a.3. In the fourth line strike the figure "204,624,141" and insert the figure "193,324,333." Subsection a.5. last line. Strike the figure $324,918" and insert the figure $294,889." Subsection b.1, last line. Strike the figure "$324,918" and insert the figure "$294,889." Subsection b.2, last line. Strike the figure "$17,280" and insert the figure "$27,107."

Plate 4. In note pointing to power guide curve showing period January 1961–July 1963, strike the month "July" and insert the month "August." In the note for the period August 1963–December 1963, strike the month "August" and insert the month "September."

[1221]

Revised November 1967

Components in Formula

Item	1/1-6/4/61[1] $	6/5-12/31/61[2] $	1962 $	1963 $
C_p	248,147	336,200	585,629	592,756
V_n	19,073[3]	70,482[4]	131,991	181,735
V_f	275,970	373,896	650,629	668,116
V_d	19,073	70,482	131,991	181,735

When the above components are used in the formula the payments are computed as follows.

Payment for 1961

1/1 - 6/4: Lay, Mitchell, and Jordan

$$P_n = (248,147) \frac{19,073}{275,970 + 19,073} = \$16,041$$

6/5 - 12/31: Weiss, Lay, Mitchell, and Jordan

$$P_n = (336,200) \frac{70,482}{373,896 + 70,482} = \underline{\$53,324}$$

Total for four plants $69,365

Payment for 1962

Four plants:

$$P_n = (585,629) \frac{131,991}{650,629 + 131,991} = \$98,768$$

Payment for 1963

Four plants:

$$P_n = (592,756) \frac{181,735}{668,116 + 181,735} = \underline{\$126,756}$$

Total payment for 1961-63 $294,889

1/ Lay, Mitchell, and Jordan only generating during this period - 155 days
2/ All four plants operating during this period - 210 days
3/ 9,263,033 kwh during period at Lay, Mitchell, and Jordan. At 2.059 mills/kwh = $19,073
4/ 6,278,870 kwh at Weiss plus 27,952,386 kwh at Lay, Mitchell, and Jordan. At 2.059 mills/kwh = $70,482

[1258]

[Exhibit No. 24]

UNITED STATES OF AMERICA
FEDERAL POWER COMMISSION

ALABAMA POWER COMPANY DOCKET NO. E-6893

STIPULATION

It is stipulated among the parties hereto that the statements hereinafter set out shall be accepted as facts for the purposes of this proceeding for the calendar years 1961, 1962 and 1963:

(1) The nominal hydraulic capacity of the turbines at the Lay and Mitchell plants is 17,850 cfs and 16,-600 cfs, respectively. The nominal hydraulic capacity at Weiss for the period June 5, 1961, through July 4, 1962, was 18,000 cfs and from July 5, 1962 on it was 26,000 cfs.

(2) Weiss Reservoir began filling on March 28, 1961, and the plant was placed in commercial operation on June 5, 1961.

(3) The investment costs for Allatoona are as follows:

Type of Facility	1961	1962	1963
Specific Power	$ 9,266,682	$ 9,266,682	$ 9,266,682
Specific Flood Control	70,287	69,917	69,535
Public-use	514,497	637,688	786,909
Joint-use	23,173,512	23,163,592	23,181,145
TOTAL	$33,024,978	$33,137,879	$33,304,271

FEDERAL POWER COMMISSION

Docket No. E-6893
Hearing Ex. No. 24
Date Identified Apr. 23, 1968
Date Admitted Apr. 23, 1968

Certified Copy
Mar 27, 1969

[1259]

(4) The portions of joint-use investment allocated to power at Allatoona are as follows:

Year	Joint-use Facilities
1961	$15,950,199
1962	$15,943,364
1963	$15,955,458

(5) The annual fixed charges on joint-use investment costs allocated to power at Allatoona are as follows:

Item	1961	1962	1963
Interest at 2.50%	$398,755	$398,584	$398,886
Amortization at 1.026%	163,649	163,579	163,703
Insurance at 0.10%	15,950	15,943	15,955
Interim Replacements	4,800	4,800	4,800
Total	$583,154	$582,906	$583,344

(6) The annual operation and maintenance costs of joint-use facilities allocated to power at Allatoona are as follows:

Item	1961	1962	1963
Operation	$44,769	$44,257	$54,605
Maintenance	21,943	23,466	30,167
Total	$66,712	$67,723	$84,772

[1260]

(7) The annual costs to be apportioned under Section 10(f) of the Federal Power Act for Allatoona are as follows:

[1260]

Item	1961	1962	1963
Interest	$398,755	$398,584	$398,886
Depreciation	163,649	163,579	163,703
Maintenance	21,943	23,466	30,167
Total	$584,347	$585,629	$592,756

(8) The travel time for storage releases from Allatoona to reach the Weiss development is about one day, and to reach Lay, Mitchell, and Jordan it is about three days. The travel time for storage releases from Weiss development to reach Lay, Mitchell, and Jordan is about two days.

4/1/68 /s/ Jesse S. Vogtle, Attorney
Date for the Alabama Power Company

4/3/68 /s/ Curtis H. Bell
Date for the Secretary of the Interior

3/28/68 /s/ Michel Levant
Date Commission Staff Counsel

* * *

[4219]

OUTPUT–the amount of power or energy delivered from a piece of equipment, station, or system.

PARTICULATE MATTER–solid particles, such as ash, released in exhaust gases at fossil-fuel plants during the combustion process.

PEAK RESPONSIBILITY–the load of a customer, a group of customers, or part of a system at the time of occurrence of the system peak.

PLANT (STATION):

Base Load Plant–a power plant which is normally operated to carry base load and which, consequently, operates essentially at a constant load.

Fossil-Fuel Plant–an electric power plant utilizing fossil fuel, coal, lignite, oil, or natural gas, as its source of energy.

Hydroelectric Plant–an electric power plant utilizing falling water for the motive force of its prime movers.

Nuclear Power Plant–an electric generating station utilizing the energy from a nuclear reactor as the source of power.

Peak Load Plant–a power plant which is normally operated to provide power during maximum load periods.

Power Plant (Generating Station)–a generating station at which are located prime movers, electric generators, and auxiliary equipment for producing electric energy.

Pumped Storage Plant–a power plant utilizing an arrangement whereby electric energy is generated for peak load use by utilizing water pumped into a storage reservoir usually during off-peak periods. A pumped storage plant may also be used to provide reserve generating capacity.

Run-of-River Plant–a hydroelectric power plant utilizing pondage or the flow of the stream as it occurs.

Steam-Electric Plant–an electric power plant utilizing steam for the motive force of its prime movers.

[4220]

Storage Plant–a hydroelectric plant associated with a reservoir having power storage.

PONDAGE–reservoir storage capacity of limited magnitude that provides only daily or weekly regulation of streamflow.

POWER–the time rate of transferring energy. Note–The term is frequently used in a broad sense, as a commodity of capacity and energy, having only general association with classic or scientific meaning (*see also* "Electric Power").

Byproduct Power–electric power produced as a byproduct incidental to some other operation.

[4220]

Continuous Power—hydroelectri ower available from a plant on a continuous basis under the most adverse hydraulic conditions contemplated.

Displacement Power—power from one generating source which displaces power from another generating source. Usually this permits power from the latter source to be transmitted to more distant loads.

Electric Power—a term used in the electric power industry to mean inclusively power and energy.

Firm Power—power intended to have assured availability to the customer to meet all or any agreed upon portion of his load requirements.

Interruptible Power—power made available under agreements which permit curtailment or cessation of delivery by the supplier.

Nonfirm Power—power which does not have assured availability to the customer to meet his load requirements.

Prime Power—Same as continuous power.

Reactive Power—the quantity in alternating current circuits that is obtained by taking the square root of the difference between the square of the kilovolt-amperes and the square of the kilowatts. It is expressed as reactive volt-amperes, or vars. Inductive reactance is expressed as positive vars and capacitive reactance is expressed as negative vars.

* * *

[4292]

UNITED STATES OF AMERICA
FEDERAL POWER COMMISSION

Alabama Power Company Docket No. E-6893

PRESIDING EXAMINER'S INITIAL DECISION ON HEADWATER BENEFITS DETERMINATION

(Issued March 25, 1969)—Exceptions due April 24

APPEARANCES

Jesse S. Vogtle and *Willard W. Gatchell* with whom Martin, Balch, Bingham, Hawthorne & Williams, were on the brief, for Alabama Power Company.

Curtis H. Bell for The Secretary of the Interior

Joseph B. Hobbs and *Michel Levant* for Federal Power Commission

KURTZ, PRESIDING EXAMINER: This proceeding under Section 10(f) of the Federal Power Act involves a determination of the amount of reimbursement for the years 1961, 1962 and 1963 due the United States from Alabama Power Company (Licensee), the owner of the Weiss, Lay, Mitchell and Jordan hydroelectric projects on the Coosa river, which are downstream and directly benefited by the Allatoona project of the United States on the Etowah river. The Coosa river is formed by the junction of the Etowah and Oostanaula rivers at Rome, Georgia.

[4293]

The first reimbursement by Licensee under Section 10(f)[1] of the Federal Power Act for headwater improvements benefits from the construction by the United States of the Allatoona multiple purpose project followed the Commission order issued on October 11, 1951 (10 FPC 1423). Pursuant to studies covering the period January 1, 1961 through December 31, 1963, by the Staff, the Commission on September 28, 1966, issued an order directing the Licensee to pay a total of $296,003 for the 1961-1963 period, plus $18,724 for the cost of making the determination to the date of the order, less an interim payment by the Licensee to the Commission on October 13, 1965 of $235,261 (36 FPC701). On October 28, 1966, the Licensee applied for reconsideration of the Commission's order issued September 28, 1966. The application was granted by the Commission on November 23, 1966. After a prehearing conference, the Staff,

[4293]

Secretary of the Interior and Licensee entered into a stipulation agreeing to certain matters for the purpose of this proceeding, including therein the annual costs to be apportioned under Section 10(f) of the Federal Power Act for Allatoona for the year 1961 of $584,347, for the year 1962, $585,629 and for the year 1963, $592,756, a total of $1,-762,732. The hearing was held and briefs were filed by the Staff, Interior and Licensee.

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[1] Section 10(f) in part provides: That whenever any licensee hereunder is directly benefited by the construction work of another licensee, a permittee, or of the United States of a storage reservoir or other headwater improvement, the Commission shall require as a condition of the license that the licensee so benefited shall reimburse the owner of such reservoir or other improvements for such part of the annual charges for interest, maintenance, and depreciation thereon as the Commission may deem equitable. The proportion of such charges to be paid by any licensee shall be determined by the Commission. The licensees or permittees affected shall pay to the United States the cost of making such determination as fixed by the Commission.

Whenever such reservoir or other improvement is constructed by the United States the Commission shall assess similar charges against any licensee directly benefited thereby, and any amount so assessed shall be paid into the Treasury of the United States, to be reserved and appropriated as a part of the special fund for headwater improvements as provided in Section 17 hereof.

[4294]

The Staff maintains that the equitable portion of the annual charges for interest, maintenance and depreciation on the Allatoona project to be paid by the Licensee to the United States for benefits directly received by the Licensee's downstream Weiss, Lay, Mitchell and Jordan projects under Section 10(f) of the Federal Power Act for the period of January 1, 1961 through December 31, 1963, is $361,992. Interior maintains the payment should be $461,885 and the Licensee $134,560. The Staff further maintains that the cost of making the determination is $29,212 and the Licensee would reduce this charge to $13,750.

The Federally-owned Allatoona dam is located in northwest Georgia approximately 48 miles upstream on the Etowah river from Rome, Georgia. I was completed in 1950. Allatoona is a multipurpose project with principal purposes of flood control and power. It also reduces flood inflows to the reservoir formed by the Licensee's Weiss Dam on the Coosa river 60 miles below Rome. In producing hydroelectric energy, the project operates as a peaking power plant. Other project benefits include the regulation of streamflow, public recreation and fish and wildlife conservation. The increased flow in low-flow seasons increases power production at the Licensee's plants on the Coosa river and aids navigation on the Alabama river which is formed by the Coosa and Tallapoosa rivers. The Allatoona powerhouse contains two 36,000 kilowatt generating units and one 2,000 kilowatt unit which were placed in operation in 1950. The power and energy generated at Allatoona are marketed by the Southeastern Power Administration, an agency of Interior. The reservoir formed by the Allatoona dam has a total storage capacity of 670,050 acre feet at full flood control pool elevation of 860 feet msl (mean sea level). At his elevation the reservoir covers an area of 19,201 acres. Of the total storage capacity, 302,580 acre feet between elevations 860 and 840 feet msl are reserved for control of flood flows, and 284,580 acre feet between elevation 840 and 800 are for power storage. At full summer level power pool elevation 840 feet msl, the reservoir covers 11,860 acres and has a total storage capacity of 367,470 acre feet; at minimum power pool, elevation 800 feet msl, the area covered is 3,251 acres and the capacity is 82,890 acre feet which is considered to constitute inactive storage. Run-off from about 1,100 square miles is regulated by the Allatoona reservoir. The area which may be appreciably affected by flood control operation at Allatoona includes the lower 48 miles of the Etowah river flood plain, Rome and the upper portion of the Coosa river flood plain between Rome and the Licensee's Weiss Dam. The

[4295]

1,100 square miles of drainage area controlled at Allatoona amounts to about 60 percent of the total Etowah river drainage area of 1,860 square miles at Rome, 28 percent of the combined total Etowah and Oostanaula river drainage of 4,010 square miles at Rome, and 21 percent of the total Coosa river drainage area of 5,270 square miles above the Weiss Dam. The only other flood control developments affecting the area covered by Allatoona are the local levy project along the Coosa and Oostanaula rivers which protect the fourth ward in Rome and the Weiss Dam on the Coosa river at Leesburg, Alabama near the lower limit of the area appreciably affected by flood control operations at Allatoona.

The Weiss Dam being about 130 miles downstream from the Allatoona project on the Coosa river is a multi-purpose project. It was constructed by Licensee principally for the production of hydroelectric power and to provide flood control benefits, pursuant to a license issued by the Commission on September 4, 1957, Project No. 2146 (18 FPC 257), following the suspension on June 28, 1954, by Congress of the authorization granted on March 2, 1945, to the Corps of Engineers to develop the Coosa river. The act suspending the authorization was for the purpose of providing private development of the Coosa river, subject to regulation by the Corps of Engineers and the Commission. The Weiss powerhouse contains three generating units of equal size totalling 87,750 kilowatts, two of which went into operation on June 5, 1961, and the third on July 5, 1962. The storage space between elevations 572 and 564 feet msl of about 378,000 acre feet is reserved for flood control. The license issued by the Commission provides for a six-foot power drawdown from elevation 564 to 558 feet msl, which amounts to 148,000 acre feet for the power pool. The Weiss project normally operates to produce peaking power. During the period of low streamflow the storage within the range of power pool drawdown between eleva-

tions 564 and 558 will augment the flow of the river downstream. This storage is also available seasonally for flood control. The Reservoir Regulation Manual for Weiss sets forth a "rule curve" delineating the storage allocation to power generation designated as "Area A", and to flood control designated as "Area B", throughout the year. This seasonally varying top of power pool curve is a firm division between the power and flood control pools and normally the reservoir level is to be maintained at or below the curve except when storing flood water. The compulsory drawdown each year is to elevation 558, minimum power pool. This drawdown as disclosed by the curve is on

[4296]

January 1 and then the level of the power pool can be increased to maximum elevation of 564 by April 30, and commencing on September 1, the power pool elevation must be decreased to 558 by December 31st.

The Lay Dam, placed in operation in 1914, is located 51 miles above the mouth of the Coosa river, 14 miles above Mitchell Dam and about 160 miles downstream from the Licensee's Weiss development. The powerhouse contains six units totaling 81,000 kilowatts of generating capacity, the gross head is 69 feet and the drainage area above the dam is about 9,087 square miles. The Lay Dam is one of the hydroelectric developments included in License Project No. 2146 (18 FPC 257).

The Mitchell Dam, placed in operation in 1923, is located 37 miles above the mouth of the Coosa river and about 14 miles downstream from the Lay Dam and 174 miles downstream from the Weiss development. The powerhouse contains four generating units totaling 72,500 kilowatts of generating capacity. The gross head is 66 feet and the drainage area is 9,827 square miles. On June 27, 1921 a license in Project No. 82 was issued to the Licensee covering this development.

[4296]

The Jordan Dam, placed in operation in 1929, is located 18 miles above the mouth of the Coosa river and about 19 miles downstream from the Mitchell Dam and 193 miles downstream from the Weiss development. The powerhouse contains four units totaling 100,000 kilowatts of generating capacity. The gross head is 88,7 feet and it has a drainage area of 10,165 square miles. On November 17, 1925, Project No. 618, a license was issued to the Licensee covering this development.

The Licensee in its annual reports to the Commission classifies Weiss as a storage project, which is a hydroelectric plant associated with a reservoir having power storage. Lay, Mitchell and Jordan in the annual reports, are classified by the Licensee as run-of-the-river plants, which are hydroelectric power plants utilizing pondage and flow of the stream as it occurs.

The assessment of benefits derived from Allatoona by the Licensee at its downstream plants of Weiss, Lay, Mitchell and Jordan require a determination of the energy gains and the capacity gains.

[4297]

Energy Gains

To estimate the amount of energy gained at a downstream plant, it is necessary to determine what the streamflow would have been on the unregulated stream at that plant and how the plant would have operated with the unregulated flows. It must then be determined how the downstream plant is affected by the regulation of flow from the upstream reservoir and how it operates under regulated conditions. To do this, the amount of regulated flow from the upstream reservoir that provides additional energy at the downstream plant must be computed. The daily flow at the downstream plants is taken from the records of daily turbine operations, and adjusted for the daily reservoir regulations at the upstream development, taking into account

travel time. If, on a given day, the headwater improvement stored water, thereby reducing the natural flow, it is assumed that the streamflow at the downstream plant was also reduced by the same amount of water stored; and conversely if water was released from storage, it is assumed that streamflow at the downstream plant was also increased by this amount of water release. When a loss in daily generation attributable to the headwater improvement occurs, "negative energy gains" for that day are recorded. When a gain occurs, "energy gain" for the day are credited to the headwater improvement. The difference of the sum of "energy gains" over the sum of the "negative energy gains" in a particular year is the "net energy gains" attributable to upstream regulation for that year.

The energy gains determined by the Staff result from first ascertaining the change in water conditions at each of the Licensee's plants which resulted from Allatoona regulation; second, ascertaining the portion of such changed flows which would affect generation at each plant; and third, determining the magnitude of the change in generation at each plant. All computations of energy gains are made on a daily basis. The daily change in water conditions at each of the Licensee's plants is determined by taking the daily changes in storage at Allatoona from operating records maintained by the Corps of Engineers and lagging this storage change by one day for the Weiss plant and three days for the Lay, Mitchell and Jordan plants to account for the travel time of the water from Allatoona to these plants.

As heretofore pointed out, the Weiss project has some storage capabilities of its own and performs flood control functions in addition to its power functions. Weiss is required to be operated with the generating units available at maximum

[4298]

capacity whenever the reservoir elevation is above Area A. When the reservoir area is within Area A the available generating capacity is operated on a schedule which will best suit system requirements. Based on these operating rules, it was assumed that all changes in flow at Weiss attributable to Allatoona would be usable at Weiss as long as the power pool elevation for the day had not exceeded the rule curve which bounds Area A. Whenever the Weiss reservoir elevation was above Area A, it was assumed that any changes in flow would not affect total generation since the generating units would be operating at maximum capacity. The magnitude of the change in energy generation at Weiss, when the reservoir elevation was within Area A, was determined by multiplying the daily change in inflow attributable to Allatoona by a conversion factor for the day.

In determining the effect of Allatoona regulation on the energy generation at the Lay, Mitchell and Jordan plants, the recorded flows at each of these plants were first adjusted by the amount of regulation provided by the Weiss project. Since Allatoona was on the river first and Weiss was later added as an incremental unit of the overall comprehensive development of the basin, the effect of Weiss regulation on the downstream projects was eliminated in order to determine the true effect of Allatoona regulation on these projects. This effectively results in a determination of the energy gains at Lay, Mitchell and Jordan which would equal the gains from Allatoona regulation without the further regulatory effect of the Weiss project. The additional energy gains which Weiss provides at these plants, over and above those attributable to Allatoona, were not included in this determination since such additional gains are realized by the Licensee's own efforts. Then the Staff determined the portion of the changed flows resulting from Allatoona regulation, which were usable at Lay, Mitchell and Jordan to generate energy at each of the plants, that is, the portion of changed flows which were within the hydrau-

lic turbine capacity of each of the plants generating units. The usable portion of the changed flow at each plant attributable to Allatoona was then converted to energy by application of conversion factors.

The Staff's determination of energy gains at the Weiss, Lay, Mitchell and Jordan plants, on a day-by-day basis for the period January 1, 1961 through December 31, 1963, to the Licensee are as follows: 43,494,289 kwh for 1961, 62,238,941 kwh for 1962, 87,541,103 kwh for 1963, for total net energy gains of 193,324,333 kwh. Interior from its own investigation concurs in this net energy gain.

[4299]

The Licensee made its own study to determine the energy gained from Allatoona and claims only the following: for the year 1961, net energy gains 33,575,896 kwh; for 1962, net energy gains 48,396,224 kwh; for 1963, net energy gains 65,955,784 kwh, being a total energy gained for the period of 147,927,904 kwh. The difference between the energy gain is accounted for by: unlike methodology; dissimilar assumption as to the use of storage; diverse conversion factors for translating flows through the turbine to electric energy; use of a different hydraulic capacity of the Jordan power plant; and the evaluation of the effects of evaporation, rainfall, evapotranspiration and ground water storage.

The Licensee contends that its methodology of determining energy gains or losses at its plant based on an estimate of the energy that all of its downstream plants from Allatoona would have produced if the upstream Allatoona project had not been constructed and then by subtracting from the actual meter generation at the plants, was in accordance with the Commission's practices citing *South Carolina Electric & Gas Co.*, 29 FPC 624 (1963), aff'd, 338 F.2d 898 (CA4; 1964) and *Virginia Electric & Power Co.*, 37 FPC 340 (1967), rehearing denied, 37 FPC 767 (1967). Just how these cases support the Licensee's position is difficult to understand.

In the above cases the benefits were determined for only one hydroelectric project downstream from Federally constructed projects. The Licensee's methodology would allow Weiss to preempt a portion of the headwater benefits which Allatoona is and has been furnishing the Lay, Mitchell and Jordan plants since Congressional action placed it upon the river's system in 1950. The Staff recognizes that Weiss is but a unit in the comprehensive plan for the development of the Coosa river and its tributaries which was placed on the river at a subsequent time and should be credited only with its net contribution to the then existing system. Otherwise the benefits from Allatoona would be discounted. That is, under the Licensee's proposal, certain of the benefits at Lay, Mitchell and Jordan attributable to Allatoona would be transferred to Weiss. The Staff's methodology of eliminating Weiss in determining the energy gains at Lay, Mitchell and Jordan resulting from Allatoona is reasonable and appropriate for this proceeding.

The Licensee assumed that the operation of Weiss reservoir for flood control would be the same without Allatoona although it was first on the river; in that, Weiss would be operated under the same regulations prescribed by the Secretary of the Army as set forth in the Weiss Reservoir Regulation Manual prepared by

[4300]

the District Engineer, United States Army, Engineer District, Mobile, Alabama, in cooperation with the Licensee. Licensee rests this assumption on the following language in the manual, which is a part of paragraph 30: "However, regulation plans for the flood control projects, Allatoona, Weiss, and Logan Martin, have been developed so that operations during the rising phase of a flood will be completely independent of each other." This paragraph in its entirety reads as follows:

> "30. *Correlation with other projects.* Weiss is the farthest upstream of a series of dams being con-

structed by the Alabama Power Company which, with some modification of their existing dams will completely develop the available head of the Coosa River for power. These sams also provide a substantially continuous series of pools which will serve the needs of navigation when navigation facilities are constructed. In addition, flood control storage is provided in Weiss and Logan Martin. In any such comprehensive stream development, operations at any project, particularly a storage reservoir, will affect to some degree the projects downstream. Operations at Weiss Dam affect the inflows to all of the other Coosa River projects. The inflows to Weiss Reservoir are affected by operations at Allatoona Dam, the Corps of Engineers project on the Etowah River 48 miles above Rome, Georgia and will be affected further by another Corps of Engineers project, Carters Dam, now under construction on the Coosawattee River 73 miles above Rome, Georgia. However, regulation plans for the flood control projects, Allatoona, Weiss, and Logan Martin, have been developed so that operations during the rising phase of a flood will be completely independent of each other. The same will be true of the regulation plan for Carters Dam which is expected to go into operation in 1969. Following a flood, the emptying of flood storage at Allatoona may prolong the time required to evacuate flood storage at Weiss and Logan Martin. Insofar as practicable, without depreciating the flood control value of Allatoona, releases from that project will be made so as to minimize any undesirable condition that might be created by the emptying operations. Also, in the event of a localized storm centered over one of the downstream reservoirs, operations at the upstream project will be modified to reduce outflow to the maximum extent feasible so as to alleviate the downstream flood conditions as much as possible.

[4301]

The Corps of Engineers and the Alabama Power Company have arranged for regular and rapid exchange of data which will permit the fullest coordination of their operations."

The Reservoir Regulation Manual for Allatoona, provides:

"37. *Basic method of flood-control regulation.* Operation of the project for flood control is in accordance with instructions issued by the Reservoir Regulation Section in the Mobile District Office and releases depend on the Allatoona pool level and on stages forcast for the Etowah River below Allatoona Dam and for Rome. The permissible releases for various conditions are listed in the regulation schedule, Chart 12, and represent, as long as flood-control storage is available, the estimated maximum releases which may be made without contributing to above bankfull stages on the lower Etowah River or at Rome. During the rising phase of a flood, normal power operation as a peaking plant will be permitted unless predictions indicate that the power releases when combined with flows from the uncontrolled drainage area would cause or aggravate damaging flood stages along the lower Etowah River and at Rome. In that case, power operations will be curtailed or, if necessary, limited to the service unit alone in order to provide as much flood protection as possible."

"42. *Correlation with other projects.* The only reservoir in the area affected by the flood-control operation of Allatoona Dam is one formed by the Alabama Power Company's Weiss Dam, 60 river miles below Rome, Georgia. The reservoir extends up the Coosa River to May's Bar, about 7 miles downstream from Rome. Generally, flood-control operations at Allatoona and Weiss during the rising phase of a flood will be completely independent of each other, Following a flood, the emptying of flood storage at Allatoona may prolong the time re-

quired to evacuate flood storage at Weiss. Insofar as practicable, without depreciating the flood-control value of Allatoona, releases from that project will be made so as to minimize any undesirable conditions that might be created by the emptying operations. The Corps of Engineers and the Alabama Power Company have arranged

[4302]

for regular and rapid exchange of data concerning the two projects. This will permit the fullest coordination of their operations."

The two manuals prescribed by the Corps of Engineers for the operation of the Allatoona and the Weiss reservoirs disclose a coordination between the two. Thus, it must be assumed that the prescribed operation of the Weiss reservoir would not be the same without the Allatoona project.

In the determination of energy gains attributable to Allatoona, it was assumed that the turbines are operated, whenever possible, so as to generate the maximum amount of power per unit flow. The Licensee normally operates its plants at one of two gate openings, designated as "best gate" and "full gate." Best gate operation is the opening at which the turbine discharge produces the maximum number of kilowatt hours per unit of turbine discharge. Full gate operation occurs when the gate is wide open to permit turbines to discharge the maximum amount of water. The efficiency at full gate is less than at best gate.

The usable flows at Licensee's plants attributable to Allatoona regulation were translated to energy gains by the use of conversion factors, referred to as "K" factors, which express the relationship between energy generated (kwh) and turbine flow (dsf). The daily "K" factors developed by Staff for Weiss were derived from actual gross generation abd water turbine use records. Similarly, actual daily "K" factors for Lay, Mitchell and Jordan were computed and used by Staff when both actual flows through a plant and

[4302]

adjusted flow (exclusive of Weiss regulation and water withheld at Allatoona) did not exceed best-gate flow, and when both actual and adjusted flows exceeded those for best gate operation. However, Staff employed (1) assumed full-gate "K" factors for these plants when unregulated flow was greater than the flow for best-gate operation but regulated flow was equal to or less than maximum best-gate flow, and (2) assumed best-gate "K" factors when unregulated flow was less than maximum best-gate flow but regulated flow exceeded maximum flow for operation at best gate. The "assumed" conversion factors used by Staff were based on actual plant operations in past years at maximum best-gate flow or at maximum full-gate flow.

The Licensee and Staff are in agreement with respect to 93.2 percent of all daily "K" factors used in computing the energy gains at the Licensee's plants over the three-year period.

[4303]

The disagreement respecting the remaining 6.8 percent of the "K" factors involves any day during this period when the actual and adjusted flows at a particular plant would require different gate openings. In such cases Licensee's witness determined and applied full-gate conversion factors to full-gate operations and best-gate factors to best-gate operations (1) on any day when a particular plant operated at one gate opening with Allatoona and at a different gate opening without Allatoona, or (2) when turbines at a plant operated at best gate for part of the day and at full gate for part of the day. The conversion factors were determined from monthly weighted average kwh per dsf for the particular gate opening. Where the use of these averages appeared inappropriate, because of considerable variations in Weiss reservoir levels, an actual day in the same period was selected by Licensee's witness which was similar by comparison to the day under consideration.

From the data for the month of May 1963 submitted by the Staff to show how the daily energy gains were computed, the Licensee, as an illustration, points out the Staff's error on May 20, 1963 at Mitchell, when there was a difference in gate openings with and without Allatoona. On this day, the Staff multiplied the usable Allatoona storage withdrawal of 6,627 dsf by its assumed full-gate factor of 104 for Mitchell to obtain a gain of 689,208 kwh. The actual total flow at Mitchell was 16,240 dsf and the actual generation was 1,719,200 kwh. If Allatoona had not existed, the inflow to Mitchell would have been 9,913 dsf (16,450 dsf - 6,627 dsf) according to the Staff's own assumptions. Best-gate turbine capacity at Mitchell is 13,400 dsf and Mitchell therefore would have operated at best gate with this inflow without Allatoona. The factor used should have been 113. The energy generation without Allatoona would thus have been 1,120,169 kwh and the indicated gain would be only 599,031 kwh, or 90,177 kwh (13.1 percent) less than the gain calculated by Staff. It is apparent from the above data submitted for the month of May that other similar calculations can be made when there is a difference in gate openings with and without Allatoona.

It appears that the Licensee's method of determining and applying its conversion factors here in question are more precise than those of the Staff and should be used in computing the energy gains.[2]

[2] The record does not contain data from which an adjustment to the Staff's energy gains can be calculated for the entire
(continued on next page)

[4304]

The Licensee contends that the Staff should have used 20,600 cubic feet per second as the maximum turbine capacity at the Jordan plant instead of 19,600 cubic feet per second, in the determination of benefits. The nominal hydraulic capacity of the turbines at the plants of Lay, Mitchell

and Weiss were stipulated by the parties and the Staff. This left the capacity at Jordan to be at issue. The Staff's figure resulted from a study of data up to about 1952 furnished by the Licensee which was used for prior settlement determination of benefits during the period 1950 through 1960. The original cast iron turbine runners at the Jordan plant were replaced with steel turbine runners during the following periods: Unit No. 1 in 1950, Unit No. 2 in 1951, Unit No. 3 in 1953 and Unit No. 4 in 1955. The daily turbine reports for January 14, 1963 and January 31, 1963, show flows in excess of 20,600 cubic feet per second through the turbines. Thus the use of a maximum turbine capacity of 20,600 cubic feet per second at Jordan is reasonable and should be used in determining the gains. The difference may be insignificant. However, the extent of the impact has not been computed by either the Staff or the Licensee.[3]

[2] (continued) three year period. But assuming that the average difference in daily net energy gains for those calculations where Staff and Licensee differ with respect to the "K" factors is as much as 15 percent, then the Staff's total energy gains would be reduced by about one percent or no more than 2,000,000 kwh. The total net monetary value of Staff's gains would be reduced by about $4,000 and Licensee's share of 10(f) costs, as calculated by Staff, would be reduced by an amount substantially less than $4,000.

[3]The record does not disclose what adjustment should be made to Staff's calculated energy gains at Jordan to reflect an assumed maximum full-gate turbine capacity of 20,600 cfs, as contended for by Licensee, rather than the 19,600 cfs assumed by the Staff witness. However, the record does contain Staff's daily energy gain calculations for Jordan plant for the sample month, May 1963. If 20,600 cfs is substituted for the assumed 19,600 cfs in the three daily calculations where such assumed figure was used by the Staff witness, the energy gains for that month would be 393,385 kwh over and above the 8,368,131 kwh calculated by Staff. The schedule for this month does not indicate the use of an assumed 19,600 cfs on any day for which negative energy gains were calculated.

[4305]

The Licensee claims that at Lay, Mitchell and Jordan the Staff did not give effect to the use of storage to reduce the benefits attributable to Allatoona. Lay, Mitchell and Jordan are not storage plants but "run-of-the-river plants" as reported by the Licensee for the years 1961, 1962, and 1963 to the Commission. Run-of-the-river-plants use streamflows essentially as received at the project site and the pondage is used for regulating the daily flows. As pointed out by the Licensee's engineer, that pondage below the top of the power pool at Lay, Mitchell and Jordan was used on a few occasions to re-regulate inflows to permit use at a subsequent date when flows could be utilized to best advantage. The Licensee refers in its brief to the storage at Lay, Mitchell and Jordan as reducing the amount of energy gains, as estimated by the Staff, by approximately two million kwh. The energy gain referred to of two million at Lay, Mitchell and Jordan by the Licensee relates to gains from additional storage over that used by the Staff at Weiss. Further, Licensee's engineer, when asked how much this water would reduce the energy gains, stated that he really didn't know. When pressed, he stated the figure of one percent of 194 million, being the two million figure referred to by the Licensee. The two million kwh figure is nothing more than a guess. Licensee's proposed adjustment is unsupported and cannot be allowed.

The Licensee further contends that the Staff improperly assumed that the amount os streamflow regulation provided each day at the Allatoona reservoir during the years 1961, 1962 and 1963 are represented by daily changes in reservoir volume without regard to the effects of evaporation, rainfall, evapotranspiration or ground water storage. Thus the energy developed at its plants attributable to Allatoona reservoir should be reduced. The Licensee first approached the amount of stream regulation similar to the method used by the Staff. Then its calculated gains were adjusted for the claimed error.

[4305]

In arriving at the so-called error, the Licensee's witness assumed that the evapotranspiration losses from the reservoir area prior to construction of Allatoona are equal to evaporation losses from the surface of the reservoir after construction of Allatoona plant. The witness assumed that the change in ground water volume approaches zero over the long run, but on a day-to-day basis he claimed it constitutes a significant factor and since the regulation provided by Allatoona reservoir is determined on a daily basis it cannot be irgnored. Yet the day-to-day calculations which the witness develops to ignore daily changes in ground water volume. According to the Licensee the final

[4306]

equation developed for determing the Staff's error of measurement involve only three phenomena: the direct rainfall on the lake surface; the evaporation from the lake surface; and the natural flow which would have occurred from the area covered by the lake. The Licensee in its brief states that the claimed error is computed in the following manner. The rainfall for the three-year period was established at Allatoona dam. The portion of the total rainfall which would have been usable under natural conditions was determined by deducting from this total quantity the amount of evapotranspiration which would have occurred during this same period. Since evapotranspiration was assumed to be equal to evaporation over the three-year period it was not necessary to establish an independent quantity representing evapotranspiration. The quantity representing evaporation from the Allatoona reservoir was substituted for evapotranspiration, and subtraction of this quantity from total rainfall left total usable rainfall (natural flow over the three-year period). It was then necessary to distribute this total usable rainfall on a daily basis so as to permit a determination of the relationship between daily natural flow which would have occurred from the area covered by Allatoona reservoir and the daily regulation provided

by Allatoona. This daily distribution was determined from reported daily streamflows at Taylorville gauge on Hills Creek (about 5 miles downstream from Allatoona) which provided a means of determining a ratio of the daily flow at Taylorville to the total three-year flow at Taylorville. This ratio was then applied to known total usable rainfall for the three-year period at Allatoona to establish a daily distribution of natural flow at Allatoona comparable to the known daily distribution at Taylorville. The degree of accuracy of the Taylorville gauge on Hill Creek has a rating of good which means that the degree of error is believed to be less than 10 percent.[4]

[4]Item DD, USGS Surface Water Records of Georgia for 1962 published by the U. S. Department of the Interior, Geological Survey, points out that the rating of excellent indicates that in general the error in the daily records is believed to be less than 5 percent; good less than 10 percent; fair, less than 15 percent; and poor, probably more than 15 percent. Further, the records of monthly and yearly mean discharge and run-off are in general more nearly accurate than the daily records.

[4307]

The Licensee's witness also assumed in his calculations that the rainfall would be the same over the entire Allatoona reservoir area which covers an area of 19,201 acres at total storage capacity; that the evaporation pan coefficient was applicable each day throughout the three-year period regardless of weather conditions; and that the natural run-off over the entire Allatoona reservoir area is proportional on a daily basis to the run-off of Hills Creek near Taylorville, Georgia. It appears that the inherent errors in the Licensee's calculated error of measurement may far exceed the adjustments proposed and that the measurement of the physical phenomena is not supported.

Monetary Value of Energy Gains

Energy gains are evaluated on the basis of the cost of obtaining an equivalent amount of energy from an alternative

[4307]

source. The energy gains here involved based on the amount shown by the Staff, represent 0.47 percent of the Licensee's total energy generated, purchased and interchanged; 0.63 percent of the Licensee's total energy generated; and 0.85 percent of its total steam generation. All of the parties consider it reasonable and are in agreement that the net monetary value of the energy gains from Weiss, Lay, Mitchell and Jordan can be determined by the difference between the higher incremental cost of producing steam electric energy and the lesser incremental cost of generating equivalent energy at the above four hydroelectric plants. They are in further agreement as to the incremental energy costs at the hydroelectric plants, but not as to the steam electric incremental costs.

The net monetary value of the energy gains are estimated, as follows:

	Staff	Licensee	Interior
1961	$ 89,555	$ 69,652	$101,429
1962	131,991	94,802	149,369
1963	181,735	132,534	205,196
Total	$403,281	$296,988[5]	$455,994

[5]This is before the Licensee's claimed adjustment of $12,618 for evaporation, etc., heretofore disallowed.

[4308]

The agreed upon hydroelectric incremental energy cost is 0.365 mills per kwh in 1961, 0.354 in 1962, and 0.385 in 1963. The steam electric incremental unit energy costs found by the parties are as follows: (mills per kwh)

	Staff	Licensee	Interior
1961	2.424	2.289	2.697
1962	2.473	2.243	2.752
1963	2.461	2.331	2.729

The net unit value of added hydroelectric energy as found is as follows: (mills per kwh)

	Staff	Licensee	Interior
1961	2.059	1.924	2.332
1962	2.119	1.989	2.398
1963	2.076	1.946	2.344

The difference is due to the various methods used to obtain such average incremental costs of the steam electric generation. The value of the energy gains could be determined by considering when the energy gains occurred, on a day-to-day and hour-to-hour basis and in turn identifying the steam electric plants wherein the equivalent energy could be generated at the same time, for the entire period, 1961 through 1963. To make such a specific determination would involve expensive, laborious and time consuming studies. As an alternative the parties strive for a practical approach.

The Staff, in determining the value of the energy gains from Allatoona regulation, selected the steam electric plants operating in the area of the hydroelectric plants, which is also the area of the largest load center of the Licensee, being the Gadsden, Gorgas No. 2, Gorgas No. 3, and Gaston[6] steam plants. These plants represent both high cost and low cost generating units. The Staff claims that the use of the plants permits a more realistic evaluation of energy gains than the use of all of the Licensee's steam electric plants. The Licensee used all of its steam plant for determining the value of the energy gains and Interior used the same four plants as the Staff.

[6] The Gaston plant is controlled jointly by the Licensee and Georgia Power Company.

4309]

The difference in steam electric incremental unit energy costs per kwh for all practical purposes is not in the selec-

tion of the plants but in the method used in averaging such costs. The Staff for each of the three years used a hybrid method in determining the cost in that it combined the incremental cost of Gorgas No. 2 and Gorgas No. 3; then this cost was divided by the total combined generation of the two plants to obtain a unit incremental cost figure. Next it determined a unit incremental cost for Gadsden, then the unit incremental cost for Gaston. These three unit cost figures were added together and divided by three to obtain a unit incremental cost per kwh. Licensee for each of the three years found the total incremental cost for all of its steam plants and divided that total by total generation to obtain a weighted average incremental unit cost per kwh. This was the method used for determining the energy gains heretofore in the settlement proceedings and also in *South Carolina Electric & Gas Co.*, 29 FPC 624, aff'd 338 F.2d 898. Interior for each of the three years uses the same four plants as the Staff but combined the cost of Gorgas No. 2 and Gadsden and divided this cost by the total generation to obtain a unit incremental cost for these higher cost plants. The cost of Gorgas No. 3 and Gaston were combined and divided by the total generation to obtain a unit incremental cost for these lower cost plants. Then 80 percent of the unit incremental cost for the higher cost plants was added to 20 percent of the unit incremental cost for the lower cost plants to arrive at a unit incremental cost per kwh. The use of the 80 percent was on the assumption that a like percentage of the energy gains would occur during peak demand periods and be generated at the higher cost plants.

In arriving at the 80 percent figure, Interior's witness assumed that, under economic dispatch, no steam unit would be loaded above its minimum load unless this generating source was at the time the cheapest source of energy available. Then he made a "judgment" as to when the gains would occur at the Licensee's Coosa river plants and then assigned the gains (positive or negative) to the high cost plants if the units in these high cost plants were operated above minimum load at the time the enrgy gains would have

occurred. The low cost plants were used only if higher cost plants were on minimum loads. Contrary to the witness's assumptions, in the interest of service reliability, the Licensee does not assign its steam electric generating plants on this basis. Many of the higher cost plants are scheduled above minimum load at times when cheaper plants are scheduled at less than maximum. During each of the four peak

[4310]

demand months of June, July, August and September, the Licensee's low cost plants had sufficient excess capacity to more than meet the energy gains. Further, Interior's witness used 96 hours of each week, 16 hours per day, Monday through Saturday, as the Licensee's peak period and the remaining 72 hours as off peak. The peak period actually is 70 hours per week, 14 hours per day, Monday through Friday, the remaining 98 hours per week being off-peak hours, as disclosed by the operations followed by the Southern System of which the Licensee is a member. Further, the witness shifted the water flows on Sunday through the turbines at Lay, Mitchell and Jordan to the peak period, although in his study, he assumed that all water would be run through the turbines on the day it arrives at the plants. Also he failed to recognize that part of the energy gains at Weiss occurred on Saturdays and Sundays.

It appears that no justification has been shown for changing the method heretofore used for averaging the costs on the Licensee's system. It may be that the selection of the four plants with which to evaluate the energy gains may be more appropriate than the use of all the Licensee's steam electric plants, but the issue as to the selection of the plants is so inconsequential as to merit no further consideration. Using the method employed by the Licensee in averaging the cost, the net unit values based on the four plants is quite close to the net unit values based on all of the Licensee's steam plants for each of the years, being as follows: (mills per kwh)

[4310]

	All Plants	Four Plants
1961	1.924	1.962
1962	1.889	1.876
1963	1.946	1.937

Further, the total value of Staff's energy gains for the three years on the above net unit value is $371,702 using all plants and $371,757 using the four plants, a difference of only $55.

Capacity Gains

Peaks in the demand for electricity normally occur at certain hours of the day, days of the week and seasons of the year. Whether the maximum peak demand of a system lasts for a few minutes or a few hours, generating capacity must be available

[4311]

for supplying the demand at the moment it develops. Hydroelectric plants are an important source of peaking capacity considering not only cost but also the ability to change power output rapidly.

Licensee is a subsidiary of the Southern Company and its generating and transmission facilities along with those of its operating sister companies, Georgia Power Company, Gulf Power Company and Mississippi Power Company are a part of a coordinated operation known as the Southern Company System. The coordinated operation of the power pool, among the power companies is by Southern Services, Inc., a mutually owned service company, acting under the direction of an operating committee made up of a representative of each of the power companies together with a representative of Southern Services, Inc. Licensee, as a member of this Southern Company power pool, takes part in transactions which deal with two types of capacities: namely, peak period capacity and system peak hour capacity and receives monetary benefits therefrom. Peak period capacity is that

available to supply load during 70 hours per week during the peak period defined as 7:00 a.m. to 9:00 p.m. of the 5 weekdays of Monday through Friday. With respect to hydro, the peak period capacity is ascertained under 1931 adverse flow conditions, the critical period being June through December with November flow extended through December. The peak hour capacity is determined as of August and December under 1931 adverse flow conditions with the reservoir at minimum elevation in December.

Licensee contends that the above peak period capacity is not dependable capacity,[7] for which it received monetary value.

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[7]Dependable capacity as used for reporting in F. P. C. Form No. 12, Power System Statement, Schedule 16, is as follows:

> The dependable capacity of System hydro plants, as defined for Schedule 16, relates to the capacity which under the most adverse flow conditions of record can be relied upon to carry the system load, provide dependable reserve capacity, and meet firm power obligations, taking into account seasonal variations and other characteristics of the load to be supplied and of the firm power obligations.

(continued on next page)

[4312]

The direct benefits that a Licensee receives by the construction of a reservoir or other headwater improvement includes gains in capacity, for which it must reimburse the owner of the headwater improvement as provided in Section 10(f) of the Federal Power Act. The gains in peak period capacity from Allatoona regulation are a direct benefit. Such gains in capacity are a part of the capacity used in the planning of generation to meet the demands for electric power. The determination of capabilities under the adverse flow conditions of 1931 include planned use of streamflow and storage. Further, for such gains in capacity Licensee received payment under the power pool contracts. In support of the claim that it realized no peak period capacity revenues,

[4312]

Licensee asserts that it had out of the integrated system capacity assigned, an excess of 70-hour per week peak period capacity unusable and unsaleable within or outside of the Southern Company power pool. This claimed excess peak period capacity in 1961, 1962 and 1963 was the result of the addition of new power supply on the Southern Company System and by Licensee, and not by Allatoona regulation. Licensee's claim is based on the assignment in this proceeding of such excess capacity entirely to

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[7] (continued)

In the glossary of power and rate terms prepared under the direction of Inter-Agency Committee on Water Resources and promulgated by the Federal Power Commission, dependable capacity is defined as:

> The load-carrying ability of a station or system under adverse conditions for the time interval and period specified when related to the characteristics of the load to be supplied. Dependable capacity of a system includes net firm power purchases.

A more detailed explanation of the above definitions is found in the Commission publication, Hydroelectric Power Evaluation 1968, under factors to be considered in hydroelectric power evaluation studies, page 19. In *South Carolina Electric & Gas Co. v. FPC*, 338 F.2d 898, 901 (1946), the Court stated that the term dependable capacity when applied to a hydroelectric enterprise means "its load-carrying ability at the time of the annual system peak load, assuming a recurrence of the most adverse stream flow conditions of record."

[4313]

hydro-plants. Licensee's stated hydro capacity only represented 14.5 to 19.2 percent of its reliable available capacity is represented by its steam fuel plants, including one-sixth of capacity in Gulf Power Company's plant under contract to Licensee, and purchased power from its jointly owned Southern Electric Generating Company. If an excess of planned capabilities did in fact exist, then under prudent management, the steam generation would have been curtailed because of the greater expenses per kilowatt of generation and also new additions to generation would have been curtailed. Licensee's further assertion that it had no

assurance of scheduled releases from Allatoona is academic in view of the Alabama-Coosa River Basin Reservoir Regulation Manual for Allatoona reservoir and the use of the streamflows and storage in the planning of system capabilities.

Interior claims that the Southern Company System realized dependable capacity gains from Weiss, Lay, Mitchell and Jordan as a result of Allatoona regulation, of 3,000 kilowatts in 1961 and 6,000 kilowatts for each of the years 1962 and 1963. These gains are then transferred to Licensee and a monetary value is placed thereon of $64,410 for 1961, $94,389 for 1962 and $94,312 for 1963. The dependable capacity gains rest on the claim that Southern Service, to meet the planned loads of the Southern Company System, plans to draw on all reservoir storage within the system to obtain needed energy.[8] As a result of the additional generation at Licensee's Coosa river plants resulting from Allatoona, the storage drawdown otherwise necessary at the other system hydro-plants is reduced. Interior's study as to planned drawdown of reservoir storage rests on information reported by the Southern Company and includes certain operational studies made by Interior's witness which the Staff questions. The dependable capacity figures are not those realized by Licensee. Just how the Southern Company's benefits from dependable capacity derived from Allatoona should be assigned to the Licensee is not shown. The short answer to Interior's claim is that the benefits to the Southern Company System, apart from the benefits to the Licensee, are not direct benefits to Licensee as contemplated by Section 10(f) of the Federal Power Act.

[8]The reservoir storage includes other hydroelectric storage plants owned by Licensee and Georgia Power Company, located in river basins other than the Coosa river basin.

[4314]

There appears to be an inconsistency in Staff's presentation as to capacity benefits to Licensee from Allatoona. One

Staff witness found no "dependable capacity" benefits. However, he did not make a capacity study for Licensee's operations relating to the 70-hour per week peak period capacity referred to in the power pool contracts. Such a study was made by Dr. Jessel, an electrical engineer and Assistant Chief of the Commission's Bureau of Power.

Dr. Jessel's approach was to analyze the effect of increased generation at the Coosa river plants attributable to Allatoona regulation, under adverse flow conditions, upon the intercompany transactions under the Southern Company power pool contracts in effect for 1961, 1962 and 1963. His study consisted of an analysis of data relating to the energy availability and peak hour capabilities of Licensee's hydroplants and of those of the Southern Company System, based on 1931 adverse flow conditions; an evaluation of the peak hour capacity and 70-hour per week peak period capacity as set forth in the power pool interchange contracts; a determination of firm energy attributable to Allatoona storage at the Coosa river plants; a conversion of such energy to 70-hour gains of peak period capacity. This study discloses that Licensee received the following gains in peak period capacity at the Coosa river plants attributable to Allatoona regulation of 8,178 kilowatts for 1961, and 5,104 kilowatts for each of the years 1962 and 1963; representing a net monetary value to Licensee of $32,613, $30,367 and $31,027, respectively. In determining the dollar value of the annual capacity benefits to Licensee, unit capacity net values realized by Licensee were employed of $4.006 per kilowatt-year for 1961, $5.950 for 1962, and $6.079 for 1963. These net unit values represent the difference between the values of peak period capacity and peak hour capacity derived from fixed receipts by Licensee from sales to other pool members of peak period and peak hour capacity based on 1931 adverse flow conditions.

Interior, assuming *arguendo* the validity of Dr. Jessel's approach, claims that his study understates the capacity and monetary benefits to Licensee from Allatoona regulation, in that the adjustment for Lay, Mitchell and Jordan based

on the 1931 critical period for the use of Weiss storage is overstated by 6,000,000 kilowatt-hours. Interior relies upon figures submitted by Licensee in response to letter from the Commission's Staff. Dr. Jessel did not consider these figures because he had no knowledge of the underlying assumptions used, such as priority

[4315]

to Allatoona or to their own project. He preferred and did make his own determination from the original reports to the Commission.

Interior would eliminate from Dr. Jessel's study the gain in efficiency as stated in the contracts for the Lay, Mitchell and Jordan group. The power pool contracts show 285,-200,000 kilowatt-hours of energy available beginning with the contract year of June 1959, as against 278,200,000 kilowatt-hours for the preceding contract year for the Lay, Mitchell and Jordan group. Interior claims that neither Dr. Jessel or Mr. Miller, witnesses for Licensee, could explain this gain. Dr. Jessel pointed out that this increase in energy available as reported in the annual contracts of the power pool filed with the Commission could have occurred from more efficient operation at the plant and from the installation of new blades at Jordan. While the last turbine runner at Jordan was completed in 1955, the Licensee never claimed additional capacity prior to 1961. Regardless of this, Dr. Jessel pointed out that he was concerned with what credits were obtainable to Licensee under the contracts and how such credits were translated into dollars, if any.

It is also claimed by Interior that Dr. Jessel was inconsistent in reflecting a computed evaporation loss for Weiss storage in determining the natural flows available for generation, and that the evaporation loss was ignored for generation at Lay, Mitchell and Jordan. The gains in kilowatts of peak period capacity at Lay, Mitchell and Jordan attributable to the Allatoona project were related to actual generation in 1931 and the net quantities of water passing

[4315]

through the turbines. These energy figures automatically take into account such matters as streamflow, evaporation, storage releases, heads and efficiencies in the hydroelectric plants. The actual generation could not be used at Weiss under 1931 adverse hydro flows, because it was not on the river at that time.

Interior also challenges Dr. Jessel's use of 100 per week hours in converting critical period generation to peak period capacity rather than the use of 70 per week hours employed in the power pool contracts. The use of the 100 hours per week is brough about by the contract between Georgia Power Company and Southeastern Power Administration, under which Georgia Power company received the entire output from the Allatoona project scheduled at 100 hours per week, and this use of 100 hours takes into consideration the releases of water from Allatoona when the Licensee might want it within the framework of the 70 hours per week during the critical period.

[4316]

Interior claims that the adjustment reducing the amount of energy generated during the critical period attributable to Allatoona by 7 percent for off-peak generation in Dr. Jessel's study is not justified. While recognizing that the power pool contract discloses that a portion of the total critical year energy was generated off peak, Interior claims that there is no basis for assuming that critical period energy gains attributable to Allatoona were generated off peak. It argues that energy generated off peak during the critical period is due to maintenance of minimum flows downstream from Licensee's Jordan plant and there is no showing that such minimum flow requirements resulted from releases of Allatoona storage.[9]

The Staff apparently now agrees with Interior stating in its brief as follows:

> "Analysis of the data indicated that the releases during off-peak hours are made below Jordan Dam

> with water chargeable to the four Coosa river plants of Alabama Power Company, and that the allocation of such off-peak releases on a proportional basis to Allatoona project may not be adequately supported by the record of the proceeding."

The is no showing in this record that the minimum flows during the critical period would result from Licensee's Coosa river plants. Further, the argument overlooks the fact that minimum flows are required to be made from Allatoona during the off-peak period. The Allatoona Regulation Manual in paragraph 28 provides:

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[9] this objection to the 7 percent reduction rests on the following testimony of Interior's witness, to wit:

> "While I recognize that a portion of the existing Coosa River generation would be generated during off-peak hours, this generation would be only that necessary to maintain required minimum stream flows in the river below the Jordan project. These minimum flow requirements were the same before Allatoona was constructed as they are now, so I see no reason to assume that the increased generation due to Allatoona would be other than all on-peak generation."

[4317]

> "Normally, the Allatoona project will be operated as a peaking plant for the production of hydroelectric power and during off-peak periods will maintain a flow of about 200 cfs through the service unit. During low-water periods such regulation will provide increased flow downstream for navigation, water supply, pollution abatement, and other purposes."

Thus the adjustment reducing the amount of energy generated for off-peak generation attributable to Allatoona is required.

Interior also claimed that Dr. Jessel's unit costs for peaking capacity are undervalued. His unit costs were derived by simply dividing the amount of dollars received by Licensee for peaking capacity by the volume of peaking

capacity sold by Licensee. The figures suggested by Interior include a component of energy costs and consequently cannot be used.

Dr. Jessel's approach for determining the capacity benefits to Licensee derived from Allatoona at its Weiss, Lay, Mitchell and Jordan projects is an acceptable method and no adjustments thereto are warranted. It should be noted that his capacity gains fall within the definitions for dependable capacity.[10]

Determination of Payment

The payment to be made by Licensee is an allocated portion of the 10(f) costs of the headwater improvement. The parties agree that this allocation should be made through use of the following formula:

$$Pn = Cp \times \frac{Vn}{Vf + Vd}$$

where Pn = annual payment to be made for headwater benefits received at a downstream non-federal plant,

Cp = total annual 10(f) costs of the dam and reservoir to be borne by power at site and downstream,

Vn = net annual monetary value of benefits received at a downstream non-federal plant,

[10]See footnote 7, page 20.

[4318]

Vf = annual monetary value of the Federal headwater improvement to at-site power production, and

Vd = net annual monetary value of benefits received at all downstream plants.

The parties are in agreement that the total annual 10(f) costs to be proportioned are $584,347 for 1961; $585,629

for 1962; and $592,756 for 1963. Further, there is agreement that, for the instant determination, the formula component Vn equals component Vd, but as heretofore pointed out there is a disagreement as to the level of the dollar value of these benefits received. There remains the issue as to the "annual monetary value of the Federal headwater improvement to at-site power production" which is Vf in the formual. The Staff and Interior take the position that such annual monetary value is equal to the cost of the dam and reservoir at Allatoona allocated to power. This same formula and interpretation of the Vf component was used by the Staff with Commission approval, in the *South Carolina* and the *Virginia Electric & Power* cases.[11] The dam and reservoir are referred to as joint-use facilities. They serve both power production and flood control and represent only one category of the facilities provided at the Allatoona project. In addition, there are the following facilities: (1) specific power facilities which include the powerhouse and equipment, power intake works, tailrace, and the switchyard structures and equipment that are required to generate power at Allatoona; (2) specific flood control facilities which serve the purposes of flood control only; and (3) public use facilities which comprise recreational facilities.

Licensee as a part of the Vf cost, while in agreement with the above definition of Vf, would include the cost of the above specific power facilities. Since Vf forms part of the denominator of the formula, a larger value for Vf means a lower value for Pn, the annual payment to be made by the Licensee.

In essence, the Licensee's argument is that the cost of special power facilities at Allatoona, while properly excluded from the costs to be borne by power both at-site and downstream

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[11] *South Carolina Electric & Gas Co.* Docket E-6468, 29 FPC 624 (1963), aff'd 338 F.2d 898 (1964); *Virginia Electric & Power Co.* Docket E-6684, 37 FPC 340, rehearing denied 37 FPC 767 (1967).

[4319]

(Cp) since such facilities are of no benefit to downstream plants, must nevertheless be included in the value of headwater improvement to at-site power production (Vf) since the special power facilities clearly benefit at-site power production.

The Licensee does not charge the Staff with departure from prior applications of the apportionment formula. It simply claims that exclusion of the cost of special power facilities from the term Vf, as done here by the Staff and as done in previous cases by the Commission, is erroneous, and that this is the first case in which such exclusion has been directly challenged. The 10(f) costs here to be apportioned are the maintenance, interest, and depreciation costs related to that portion of the headwater improvement which benefits power production both at-site and downstream. It is conceded by the Licensee that such headwater improvement costs include only the cost of joint facilities (the dam and reservoir) and do not include the cost of special power facilities at Allatoona. The purpose of the formula is to apportion such cost of joint-use facilities allocated to power between at-site and downstream power production on the basis of the relative benefits derived at-site and downstream from such joint-use facilities. The downstream benefit is measured by the value of the energy and capacity gains realized at the Licensee's plants as a result of the Allatoona dam and reservoir (Vd). The at-site benefit is properly measured, as Staff has done, by the annual cost of these same joint-use facilities at Allatoona (Vf). No portion of the cost of special power facilities has been included in the total 10(f) costs (Cp) and therefore special facilities costs cannot be included in the cost which is intended to measure the benefit received by Licensee from such 10(f) costs. While the language used to define the term Vf may be unclear, the purpose of the formula is not. The Licensee's interpretation would violate such purpose.

Cost of Headwater Benefits Determination

Section 10(f) of the Federal Power Act provides: "The licensees or permittees affected shall pay to the United States the cost of making such determination as fixed by the Commission." The Staff's calculation of the cost under this statute is $29,212 as of April 1, 1968 determined as follows:

[4320]

	Cost to 10/1/66	10/1/66 thru 1/31/68	2/1/68 thru 3/31/68	TOTAL
HWB Salaries[12]	$13,105	$5,867	$1,473	$20,445
Bureau of Power Overhead (5%)	655	293	74	1,022
Subtotal	$13,760	$6,160	$1,547	$21,467
OGC[13] Overhead (26%)	3,577	1,602	402	5,581
Subtotal	$17,337	$7,762	$1,949	$27,048
Admin. Overhead (8%)	1,387	621	156	2,164
TOTAL	$18,724[14]	$8,383	$2,105	$29,212

Licensee would not include any cost incurred after the September 28, 1966 order in which the Commission found "the cost of the headwater benefits determination for the period through the issurance date of this order is $18,724" nor those costs incurred during that period other than for the salaries of employees in the headwater benefit section and the five percent for the Bureau of Power overheads, totalling $13,760.[15] The

[12]Headwater Benefits Section of the Division of River Basins of the Commission's Bureau of Power.

[13]Office of General Counsel.

[14]The Staff's exhibit shows the cost to October 1, 1966, only in total. Such total has been spread back to functions in the manner suggested by Licensee's Witness Miller.

[15]Licensee Witness Miller used a rounded figure of $13,750.

[4321]

statute is clear that the costs are not restricted to those incurred prior to the September 28, 1966 order but include all costs incurred up to the time of the Commission's final determination. In the administrative procedures such as involved in this proceeding additional investigations and studies made during a hearing are a common occurrence. The Licensee has not been charged here with such costs which were incurred during the time of this hearing. The 26 percent entitled Office of General Counsel overheads $5,581 and the 8 percent entitled Federal Power Commission Administration overheads $2,164 to which Licensee objects represent time spent other than by the headwater benefits section. While the charges are not broken down into time studies as set forth in the cost of the headwater benefits section, but merely as a percentage of such costs, it cannot help but be apparent that $7,745 would not cover all of the costs incurred if similar time studies had been made. The charge of $29,212 appears to be a reasonable amount for the cost determination of the headwater benefits in this proceeding.

[4322]

ADDITIONAL FINDINGS AND CONCLUSIONS

Upon consideration of the record and the briefs filed in this proceeding, it is further found and concluded that:

(1) The equitable portions of annual charges for interest, maintenance, and depreciation on the Federal Allatoona project to be paid by Alabama Power Company to the United States for benefits directly received at its downstream Weiss, Lay, Mitchell and Jordan projects are as stated by the Staff on June 25, 1968 (Exhibit No. 49) $97,289 for the year 1961, $116,954 for the year 1962, and $143,171 for the year 1963, adjusted in accordance with the findings heretofore made pertaining to the conversion factors, the hydraulic capacity of the Jordan plant, and the net unit value of hydroelectric energy.

(2) The cost of the headwater benefits determination in this proceeding for the period through March 31, 1968, is $29,212.

(3) Alabama Power Company on October 13, 1965, made an interim or partial payment of $235,261.

ORDER

WHEREFORE, IT IS ORDERED, subject to review by the Commission, that Alabama Power Company shall pay to the Federal Power Commission within sixty days of this determination, the computed amounts referred to in the above finding (1), less the amount of the interim payment of $235,261, plus the cost of making this determination through March 31, 1968 of $29,212.

/s/ Alvin A. Kurtz
Presiding Examiner

[4435]

BEFORE THE FEDERAL POWER COMMISSION

Alabama Power Company Docket No. E-6893

COMMISSION STAFF BRIEF OPPOSING EXCEPTIONS

A. STATEMENT OF THE CASE

This is a proceeding under subsection 10(f) of the Federal Power Act to determine payments to be made to the United States for power benefits provided by a Federal headwater improvement, namely, the Allatoona development on the Etowah River, to Alabama Power Company, which is a licensee of several downstream hydroelectric developments on the Coosa River. This case is concerned with the payments to be made by Alabama Power Company for the period January 1, 1961 through December 31, 1963.

Alabama Power Company (Alabama or Licensee) had made payments for prior headwater benefits received during the years 1950 through 1960 and none of these involved a formal hearing. In this proceeding, the Staff made a study for years 1961 through 1963 and recommended that Licensee make a payment in the amount of $324,918 to the United States for headwater benefits received during that period plus

[4436]

$17,280 for the cost of the investigation. The Staff report giving the basis for such recommended payments was supplied to Alabama for its information and comments. On October 13, 1965, Alabama paid $235,261 under an interim billing in response to a letter from the Commission dated July 27, 1965.

On September 28, 1966, the Commission issued a "Headwater Benefits Determination" after consideration of the materials before it and ordered Licensee to pay $296,003

for benefits provided by Allatoona, less $235,261 already paid, plus $18,724 for the cost of the investigation, the total remaining to be paid being $79,466. On November 23, 1966, the Commission issued an Order granting rehearing, requested by Alabama, for purposes of further consideration and fixing hearing. Following a prehearing conference, the formal hearing commenced on April 23, 1968 and continued through April 25, 1968 during which Licensee, the Secretary of the Interior, and the Staff presented their direct cases. The hearing was reconvened on June 25, 1968, continuing for four days during which rebuttal and sur-rebuttal evidence was offered, and was concluded on June 28, 1969.

Initial briefs by all three participants are dated September 6, 1968 and the reply briefs, October 8, 1969. The Presiding Examiner issued his Initial Decision on March 25,

[4437]

1969. Alabama Power Company and the Secretary of the Interior, each submitted Exceptions and a Brief on Exception to the Initial Decision, under dates of April 23, 1969 and April 24, 1969, respectively. The Staff did not submit a brief on exceptions to the Initial Decision.

The 31 page Initial Decision finds and concludes that Alabama Power Company should pay, for benefits directly received at its downstream Weiss, Lay, Mitchell and Jordan hydroelectric developments, specific annual dollar amounts to be computed on the basis of adjustments for conversion factors, Jordan plant hydraulic capacity, and net unit value of hydroelectric energy in accordance with findings which were made by the Presiding Examiner. The dollar amounts set forth by the Examiner before adjustments are $97,289 for 1961, $116,954 for 1962 and $143,171 for 1963, the unadjusted total being $357,414. The adjusted amounts recomputed by Staff, as directed by the Presiding Examiner, are $90,212 for 1961, $105,937 for 1962, and $136,682 for 1963, the total being

[4438]

$332,831.[1] The aforesaid interim payment of $235,261 already made would be deducted from $332,831, leaving $97,570. The Presiding Examiner also found $29,212 to be the cost of the headwater benefits determination for the period through March 31, 1968. This amount of $29,212 plus $97,570 would be due from Alabama Power Company.

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[1] This represents a reduction of $24,583 from the amount of $357,-414 shown in Exhibit 49. Of the $24,583 reduction $17,832 is attributable to the use of Licensee's values of energy gains and $6,751 is attributable to the adjustments in the amount of energy gains based on the Examiner's K factor and Jordan hydraulic capacity adjustments in accordance with the Examiner's instructions.

[4534]

UNITED STATES OF AMERICA
FEDERAL POWER COMMISSION

OPINION NO. 569

Alabama Power Company — Docket No. E-6893

OPINION AND ORDER DETERMINING ANNUAL CHARGES FOR BENEFITS FROM HEADWATER DEVELOPMENT

Issued: December 17, 1969

[4535]

UNITED STATES OF AMERICA
FEDERAL POWER COMMISSION

Alabama Power Company — Docket No. E-6893

OPINION NO. 569

APPEARANCES

Jesse S. Vogtle and *Willard W. Gatchell* with whom Martin, Balch, Bingham, Hawthorne & Williams, were on the brief, for Alabama Power Company

Curtis H. Bell for The Secretary of the Interior

Joseph B. Hobbs and *Michel Levant* for the staff of the Federal Power Commission

[4536]

UNITED STATES OF AMERICA
FEDERAL POWER COMMISSION

ANNUAL CHARGES (Headwater benefits)

Before Commissioners: John N. Nassikas, Chairman;
L. J. O'Connor, Jr.,
Carl E. Bagge,
John A. Carver, Jr., and
Albert B. Brooke, Jr.

Alabama Power Company — Docket No. E-6893

OPINION NO. 569

OPINION AND ORDER DETERMINING ANNUAL CHARGES FOR BENEFITS FROM HEADWATER DEVELOPMENT

(Issued December 17, 1969)

CARVER, Commissioner:

1. By order issued October 11, 1951 (10 F.P.C. 1423), the Commission initiated proceedings to determine the obligation of Alabama Power Company (Licensee) to the United States for headwater benefits received by its hydroelectric plants in the Alabama portion of the Coosa River basin. Benefits compensable under Section 10(f) of the Federal Power Act (Act)[1] had been created by completion and placing in operation (in 1950) of the Allatoona

[1] Act of June 10, 1920 (41 Stat. 1063, 1068) as amended (16 U.S.C. 803(f)), providing in pertinent part as follows:

[4536]

(f) That whenever any licensee hereunder is directly benefited by the construction work of another licensee, a permittee, or of the United States of a storage reservoir or other headwater improvement, the Commission shall require as a condition of the license that the licensee so benefited shall reimburse the owner of such reservoir or other improvements for such part of the annual charges for interest, maintenance, and depreciation thereon as the Commission may deem equitable. The proportion of such charges to be paid by any licensee shall be determined by the

[4537]

project, a multi-purpose structure built by the U.S. Corps of Engineers on an upstream tributary of the Coosa to provide flood control, stream regulation and power generation in the Coosa basin.

2. At the time of the first headwater benefits determination for the years 1950-52, as set forth in 13 F.P.C. 1317, and for subsequent periods up to the present proceeding, Licensee maintained and operated hydroelectric generating plants at three downstream locations, the Jordan, Mitchell and Lay Dams. In successive later determinations for the periods 1953-55 (16 F.P.C. 827), 1956-57 (22 F.P.C. 749), and 1958-60 (27 F.P.C. 398), benefit charges were assessed and accepted by Licensee without protest or hearing. Over the most recent of the above periods (1958-60), it was found that the three plants then in operation experienced a total increase in generation (energy gains) of 111,229,125 kwh attributable to flow regulation at Allatoona, with no assessment for any adjustment in dependable capacity. Pursuant thereto, Licensee remitted to the Commission the sum of $168,221, for headwater benefits received for the three-year period, plus $6,560 as the Commission's cost of making the determination.

3. In accordance with prior practice, the Commission Staff conducted a further investigation to determine the assessment for benefits received during the years 1961 through 1963. On the basis of the resulting findings, as modified

after consultation with Licensee and interested Federal agencies, determination was made (36 F.P.C. 701)

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[1] continued

Commission. The licensees or permittees affected shall pay to the United States the cost of making such determination as fixed by the Commission.

Whenever such reservoir or other improvement is constructed by the United States the Commission shall assess similar charges against any licensee directly benefited thereby, and any amount so assessed shall be paid into the Treasury of the United States, to be reserved and appropriated as a part of the special fund for headwater improvements as provided in section 17 hereof.

[4538]

that total energy gains of 193,324,333 kwh had been realized and that payment was due in the total amount of $314,727 ($296,003) for actual benefits received plus $18,724 as the cost of determination to that date). Since Licensee had previously paid $235,261 in response to an interim billing, the net amount due was set at $79,466. In part, at least, the increase in energy gains and benefit charges over the last previous determination stems from the installation and operation by Licensee of a new generating and storage structure, the Weiss development, as detailed below.

4. On October 28, 1966, Licensee filed application for rehearing of the above determination order, alleging error in that full recognition was not given to storage provided by Licensee's Weiss reservoir and its three downstream run-of-river projects, incremental unit cost of alternative energy was improperly computed, and discount had not been made for the effect of evaporation from the Allatoona reservoir. Application for rehearing was granted (36 F.P.C. 883) and full public hearing ordered "respecting the matters involved and the questions presented in this proceeding."

5. In the hearing conducted by Presiding Examiner Alvin A. Kurtz between February 14 and June 28, 1968, testimony, exhibits and legal argument were presented by Licen-

[4538]

see, Staff and the Department of the Interior (Interior).[2] Initial and reply briefs were filed and exchanged by the above parties in due course and an Initial Decision was issued by Examiner Kurtz on March 25, 1969.

6. The matter is now before the Commission for review of the Initial Decision in the light of exceptions filed by Licensee and Interior. Staff entered no exceptions to the Examiner's Decision, but has filed a brief

[2] Interior has customarily intervened in headwater benefit cases which involve Federal stream improvements having installed hydroelectric generating capacity, pursuant to its power marketing functions under Section 5, Flood Control Act of 1944 (58 Stat. 890, 16 U.S.C. 825s).

[4539]

opposing various exceptions asserted by the other parties. By separate motion filed April 24, 1969, Licensee requested oral argument in the matter.

THE PROJECTS

7. The Federally-owned Allatoona dam was completed in 1950 and is located in northwest Georgia approximately 48 miles upstream on the Etowah River from Rome, Georgia. Allatoona is a multi-purpose project with principal functions of flood control and power. It also reduces flood inflows to the reservoir formed by the Licensee's Weiss Dam on the Coosa River[3] and operates as a peaking power plant. Other project benefits include the regulation of streamflow, public recreation and fish and wildlife conservation. The increased flow in low-flow seasons increases power production at the Licensee's plants on the Coosa River and aids navigation of the Alabama River.

8. The Weiss Dam, which is also a multi-purpose project, is about 130 miles downstream from the Allatoona project. Licensee constructed Weiss Dam principally for the produc-

tion of hydroelectric power and to provide flood control benefits, pursuant to a license issued by the Commission on September 4, 1957, Project No. 2146 (18 F.P.C. 257). The Weiss project has three generating units totaling 87,750 kilowatts and normally operates to produce peaking power. The Lay Dam, placed in operation in 1914, is located 51 miles above the mouth of the Coosa River, and 160 miles downstream from Weiss Dam. Its generating capacity is 81,000 kilowatts. The Lay Dam is included as a separate development in the Weiss project license. Next downriver is the Mitchell Dam, placed in operation in 1923 and situated 37 miles above the mouth of Coosa and 14 miles below Lay. Its capacity is rated at 72,500 kilowatts. On June 27, 1921, a license was issued for this development, Project No. 82. Last in line is Jordan Dam, placed in operation in 1929 and located 18 miles above the mouth of the Coosa and 19 miles downstream from Mitchell Dam. It has 100,000 kilowatts of generating capacity and was licensed in 1925 as Project No. 618.

[3]The Coosa River is formed by the junction of the Etowah and Oostanaula Rivers at Rome, Georgia.

[4540]

9. Licensee in its annual reports to the Commission classifies Weiss as a storage project (i.e., a hydroelectric plant associated with a reservoir having power storage) and Lay, Mitchell and Jordan are classified by the Licensee as run-of-the-river plants (i.e., hydroelectric power plants utilizing pondage and flow of the stream as it occurs).

THE INITIAL DECISION AND EXCEPTIONS THERETO

10. At the outset the parties agreed that the determination of benefits should be governed by a formula approved by the Commission in prior adjudications.[4] However, there was initial disagreement as to the amount or value to be assigned to three of the four components of the formula. One of the

factors in dispute (monetary value of the headwater improvement to Allatoona's at-site power production) was quickly resolved in favor of the Staff-Interior view, and properly so in the light of consistent Commission practice in cases cited by the Presiding Examiner. Licensee's exception on this point (Exception No. 8) is accordingly denied.

11. The remaining two components in the formula are, in this instance, identical since all of the downstream plants on the Coosa River are under Licensee's common ownership and control. Disagreement over how to measure the actual monetary value of the Federal headwater improvement to power production at the downstream licensed developments constitutes the central issue in this proceeding and commanded most of the Examiner's attention. Again relying on prior determinations, the Examiner and the parties proceeded on the basis that power production benefits, if any, would take the form of energy gains and capacity gains at the downstream plants.

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[4]For reasons set forth in the text, there is no need to set forth the formula here, or to define its elements. The formula and discussion of its elements is set forth in Initial Decision, p. 26 (mimeo) and also in *Virginia Electric & Power Co.*, 37 FPC 340, 358 (1967).

[4541]

12. As analyzed by the Examiner and argued by the parties in subsequent briefs, this review proceeding involves four basic issues: (1) the methodology used and the factors considered in determining net energy gains at Licensee's four downstream plants, (2) monetary value of such energy gains, (3) determination and value of dependable capacity gains, if any, at such plants, and (4) the amount chargeable to Licensee as the cost of making the investigation and determination.

13. In the Initial Decision, the contending positions of the parties on the various issues have been treated with great diversity: the Examiner adopted the basic premise ad-

vanced by Staff (and Interior) with regard to energy gain measurement, but with important modifications; gave general support to Licensee's approach in computing the monetary value of such gains; followed a capacity gain concept first set forth by Interior (although later modified, refined and developed by Staff); and accepted the Staff-Interior conclusion as to the cost of making the determination. Not unexpectedly, therefore, the exceptions of Licensee and Interior are numerous and varied, encompassing all of the basic issues enumerated above.

14. In total effect, the varying methodologies advanced or used result in widely disparate conclusions as to the compensable amount due. These may be summarized and compared as follows:

Source	Charge for Headwater Benefits Received	Cost of determination	Total
Commission order (36 FPC 701) (initial Staff position)	$296,003	$18,724	$314,727
Examiner	332,831[5]	29,212	362,043
Revised Staff computation	361,992[6]	29,212	391,204
Interior	461,885	29,212	491,097
Licensee	134,560	13,750	148,310[7]

See next page for footnotes

[4542]

ENERGY GAINS

15. With the addition of Weiss generating capacity in the 1961-63 period, the studies conducted by Staff in this proceeding conclude that energy gains over the three years totalled 193,324,333 kwh. Interior's investigation supports a similar conclusion. Licensee, however, contends that it realized only 147,927,904 kwh of added generation from this source.

[4542]

16. The resulting discrepancy of approximately 23 percent is traceable to the following differences in methodology used in computing the energy gain factor: (1) Licensee's use of Weiss' reregulating influence to reduce the effect of Allatoona's flow regulation on downstream plants, (2) dissimilar assumptions as to the use

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[5] The actual amount was not determined by the Examiner. In his order he took Staff's figures and directed that they be adjusted in accordance with certain findings made on a conversion factor, the hydraulic capacity of one of the Licensee's plants, and the net unit value of hydro generation. The figure given is Staff's recomputation, following the Examiner's instructions. (Staff Br. Opp. Exc. pp.3-4).

[6] As set forth in Staff Br. at p. 70. This figure varies from the $357,414 claimed by Staff in Ex. 49 "to reflect an adjustment in Ex. 48 made after analysis of the record." (Staff Br., p. 59 footnote 62). The discrepancy escaped the Examiner's attention, however, since he cites one figure at p. 3 of his decision and the other at p. 31 of the same document. The recomputation described in footnote 5, above, is apparently based on the lower of the two amounts in literal compliance with the Examiner's instructions.

[7] Licensee therefore concludes that the interim payment of October 13, 1965 is in excess of the total amount due and seeks refund of the $86,951 allegedly overpaid.

[4543]

and release of storage capacities, (3) differing conversion or K factors in translating turbine flow to electrical energy, (4) alleged error by Staff (and Interior) in the hydraulic capacity of the Jordan plant during the period in question, and (5) differences in the effect given to evaporation, evapotranspiration, rainfall and ground water storage on water stored in Allatoona reservoir.

Reregulating Effect of Weiss Structure

17. Of the ten substantive exceptions [8] enumerated by Licensee, four are aimed at this point. Basically these take the form of objection to departure from precedent in that the Staff method relies on a *computation* of energy gains at

downstream sites. Licensee's approach is based on actual measurement at the downstream plants, relying on prior Commission determinations approving that practice.

18. The Examiner accepted the Staff method in this respect, pointing out that earlier cases involved only a single downstream plant and that Licensee's approach would "allow Weiss to preempt a portion of the headwater benefits which Allatoona is and has been furnishing the Lay, Mitchell and Jordan plants since Congressional action placed it upon the river's system in 1950." We approve this conclusion and hold that the Staff method of computing energy gains at Lay, Mitchell and Jordan is necessary and appropriate as the only feasible procedure for giving full effect to Allatoona's presence and operation.

19. In essence, Licensee's position is that the flow rate at the downstream locations is not entirely due to Allatoona's influence, but stems in part from the storage and release capability at Weiss. Since the latter was installed at Licensee's expense and justified on the basis of navigational, flood control and other downstream benefits, it is contended that its impact should be deducted from the total benefits otherwise allocable to Allatoona.

[8] Twelve exceptions were listed, but two were addressed to ultimate conclusions or findings of the Examiner.

[4544]

20. In effect, this claim would permit a project constructed downstream and later in time to discount, cancel out or allocate to itself the benefits originally provided by upstream headwater improvements. Similar claims on closely related issues have been litigated earlier. In *Alabama Power Company*, 34 FPC 971 (1965), an attempt to deduct the value of downstream benefits to the general public from annual charges under Section 10(e) was disallowed. More directly in point, the headwater benefit assessment resulting from the later construction of an upstream Federal project

[4544]

was not reduced by the reregulation value of a licensed project downstream. *South Carolina Electric and Gas Co. v. F.P.C.*, 338 F.2d 898 (1964). Similarly, where headwater improvements afford benefits to a later constructed downstream licensed project, no offset was allowed for reregulation provided by the latter. *Virginia Electric & Power Co. v. F.P.C.*, 351 F.2d 408 (1965). This holding was reviewed at some length and pointedly reaffirmed by this Commission in *Virginia Electric & Power Co.*, 37 FPC 340 (1967).

21. The only factual difference between the present case and those considered earlier is that here the downstream benefits accrue to the same licensee that maintains the reregulating structure. We see no basis for reaching a different conclusion. Allatoona was first in time on the river system. Weiss was justified and licensed with full knowledge of the headwater benefits potentially chargeable against the licensee's downstream plants. The Licensee cannot at this late date be sustained in its claim that it may, by its own efforts and for its own benefit, negate or usurp the value of prior Federal headwater improvements.

22. Alternatively or supplementary to its legal argument for offset in this regard, Licensee advances "traditional notions of equity" in support of its claimed adjustment. Judge Bryan's succinct treatment of that argument in *South Carolina Electric & Power Co. v. F.P.C., supra*, at 904, cannot be improved upon: "There is no equity of recoupment."

Use and Release of Storage Capacities

23. Licensee's fifth exception contests the conclusion that there is coordination between the operation of

[4545]

Allatoona and Weiss which benefit its hydroelectric operations on the river. In this claim, reliance is placed on a single sentence in paragraph 30 of the Weiss Reservoir Regulation Manual, developed cooperatively by the Corps of Engineers and Licensee, which states that "regulation plans

for the flood control projects, Allatoona, Weiss and Logan Martin, have been developed so that operations *during the rising phase of the flood* will be completely independent of each other." (emphasis supplied). Read in the context of the whole regulation applicable to Weiss and with the parallel Regulation Manual for Allatoona, however, it is clear beyond doubt that coordinated and stablilized regulation of stream flow is contemplated. While storage of flood waters is given clear priority on an emergency basis and some dislocation is anticipated in the evacuation of reservoirs after a flood period, these are recognized as exceptions to the general rule of coordinated stream management.

24. We approve the Examiner's rejection of this effort to discount the energy gains attributable to Allatoona.

Differing Conversion Factors and Calculation of the Jordan Plant's Hydraulic Capacity

25. While accepting Staff's general approach to the assessment of energy gains realized, the Examiner ordered modification of its result in two areas that have been recognized as comparatively minor, as follows:

a. Turbine flows attributable to Allatoona regulation were translated to energy generated through the use of daily conversion (or "K") factors which, in effect, measure the difference between "full-gate" operation and the more efficient use of "best-gate" flows. Licensee and Staff were in agreement on the factor to be applied over 93 percent of the time. As to the balance, Staff assumed a factor based on actual plant operations at maximum flow for the two gate openings. Licensee's conversion factors were determined from monthly weighted average kwh of generation per dsf of flow for the particular gate opening. The Examiner concluded that Licensee's method was more precise than Staff's and should be used.

[4546]

b. Staff used 19,600 cubic feet per second as the maximum turbine capacity at the Jordan plant, based on data furnished by Licensee for determinations up to 1952, and used in subsequent settlement proceedings. The present record shows, however, that the original turbine runners in the Jordan plant were replaced over a period of years ending in 1955 and that daily turbine reports for sample days in January 1963, shows flows in excess of 20,600 cubic feet per second for this plant. The Examiner found it reasonable to accept the latter figure as the maximum turbine capacity to be used in computing energy gains at Jordan.

26. Staff has expressed no objection to these adjustments in its method, the result being comparatively minor in overall effect. Interior has specified exception, however, on the principal ground that the adjustments require technical judgments outside the record. We think that the Examiner was correct in finding that the studies and method used by Licensee as to conversion factors were more detailed and more precise than the Staff-Interior measurements; the turbine capacity correction appears to be a factual matter. Moreover, despite the uncertainties and doubts expressed by Interior, Staff appears to have had little difficulty in translating the Examiner's modifications into a new and adjusted energy gain total.

27. On balance, therefore, the Examiner's conclusion appears to have better support in the record and is approved.

Licensee's Claimed Adjustment for Evaporation Losses

28. Extensive testimony was presented by Licensee to support its claim that Allatoona's energy gain contribution should be reduced by the amount of water lost through evaporation from the reservoir surface. This has proved to be an elusive factor in earlier headwater benefit determinations (see *South Carolina Electric & Gas Co.*, 29 FPC 624, 627 (1963)), and it is no less so here.

29. Licensee's case takes the form of an elaborate mathematical formula, involving numerous factors, inferences and extrapolations from limited measurable data.

[4547]

We sustain the conclusion of the Examiner that the claimed adjustment is not adequately supported and is subject to offsets which tend to negate its claimed effect.

MONETARY VALUE OF ENERGY GAINS

30. Consistent with earlier practice, the parties have agreed that the monetary value of energy gains derived from headwater improvements should be measured by comparing the incremental cost of substitute steam generated energy with the lower incremental cost of generating the same amount of hydroelectric energy. There is agreement also as to the unit incremental cost of hydroelectric generation. The varying methods used in calculating the cost of steam generation contribute, however, to the discrepancy in total result.[9]

31. The first difference arises out of the selection of the steam generating plants used for comparison. Licensee included all of the steam plants in its system. Interior and Staff considered only the production cost at four of Licensee's steam plants: Gorgas No. 2 and Gorgas No. 3 (treated by Staff as a single plant, since they are located at a single plant site), Gadsden and Gaston. This selection method was based on the fact that

[9]The gross differential among the several methods used to establish the total monetary value of energy gains for the three-year period was summarized by the Examiner (Init. Dec., mimeo., p. 16) as follows: Licensee, $296,988; Staff, $403,281; Interior $455,994. In major part, however, this disparity results from the differing methodologies followed in measuring the amount of energy gained, as discussed above, as well as variations in the unit incremental cost of substitute energy. As a measure of the latter factor alone, Staff's unit

[4547]

incremental cost figure exceeds Licensee's by 7% in 1961, 12.7% in 1962, and 6.7% in 1963; Interior's weighting system, *post*, produces unit incremental costs which exceed Licensee's by 21.2%, 26.9% and 20.4% for the same years, respectively.

[4548]

these named plants are located in closest proximity to Licensee's Coosa River developments and would be operated in closer integration with the hydroelectric output of those plants. The steam plants selected, moreover, represent both high and low cost operations, and exclude more distant low cost plants whose production would more likely be allocated to load centers other than those adjacent to the hydroelectric developments.

32. A second difference stems from the fact that Staff determined a unit incremental cost per kwh by adding the unit incremental cost of the selected steam plants (and after combining into a single unit cost the data for the two Gorgas plants) and divided the total by three for each year. Licensee took the total incremental cost for all of its steam plants and divided by total generation for each of the three years, thus arriving at a weighted average unit cost per kwh for its steam system. Interior combined the cost of Gorgas No. 2 and Gadsden (high cost plants) and divided this cost by their combined generation to obtain a unit incremental cost for each year; likewise the total cost of the low cost plants (Gorgas No. 3 and Gaston) was divided by combined generation. Interior then applied a different weighting factor through an assumption or judgment that 80 percent of the energy gains would augment peak period production at high cost steam plants and only 20 percent would be in substitution for low cost steam generation. Thus, 80 percent of the unit incremental cost for the higher cost plants was added to 20 percent of the unit incremental cost for lower cost plants to arrive at a unit incremental cost per kwh.

33. The Examiner adopted Licensee's method as to both of these factors, contending that Staff's plant selection and averaging methodology departed from previous practice. Prior settlements under this docket and the Commission's action in *South Caroline Electric & Gas Co., supra,* are cited to support this conclusion.

34. We think the Examiner erred in this reliance on precedents covering periods nearly a decade in the past (South Carolina for years through 1955; Alabama for years through 1960). No instance can be found in which the weighted average of all plants method has been used since 1962. One need only point to *Virginia Electric &*

Power Co., supra, where a single steam generation plant (Chesterfield) was used for cost comparison purposes, with Commission and judicial approval.

35. The use of an average, rather than actual, cost of steam generation has been authorized in order to avoid "the extensive study [that] would be required to determine which steam-electric plant at any particular time would have been the most likely source of equivalent generation." *South Carolina Electric & Gas Co., supra,* 650 (Initial Decision) In short, the choice among plants to provide the substitute generation depends upon a wide variety of factors, including available capacity at a given time, maintenance schedules, transmission loads, etc. An averaging method presumes random selection. But the insertion of weighting techniques, whether that advanced by Licensee or the concept favored by Interior, introduce an element of direction and control into this process by assuming that substitute generation would be contributed according to some ascertainable formula. For many reasons discussed in the record and emphasized in the briefs, this assumption has dubious validity; further, it defeats the purpose of the averaging approach as described above.

[4549]

36. We think that Staff's method for computing the monetary value of energy gains, both as to selection of steam plants for cost comparison and as to the averaging procedure, is proper and reasonable. The Examiner's contrary conclusion is modified accordingly. In this connection, we note that the Examiner has sought to minimize the differences in methodology by pointing out that the monetary difference between Staff's "four plant" and Licensee's "all plants" approach amounts to only $55 over the three-year period (Initial Decision, mimeo, p. 19). But to arrive at this result, he has changed Staff's straight averaging method by applying a conversion formula which can be derived from Licensee's weighted average approach, but which is not otherwise supported in the record. Thus, the net unit values in the "Four Plants" column of the comparative table used by the Examiner (p. 19 mimeo.) do not reflect Staff values and will not be used in implementing the conclusions reached in this opinion.

37. Our review of the record has revealed another variation in cost methodology which is not discussed in testimony or the Initial Decision and is mentioned only

[4550]

by way of footnote reference in Interior's Brief on Exceptions (at page 10). For purposes of computing incremental costs of steam generation, Staff and Licensee are in apparent agreement that 90 percent of all fuel costs and 30 percent of other operation and maintenance costs should be used. For this purpose, Staff has used data as reported by Licensee on FPC Form No. 1 for each of the years in question, so that its fuel costs item conforms to Account No. 501 in the Uniform System of Accounts; it thus includes such related assignable charges as transportation, handling, analysis and residue disposal. Licensee, however, departs from this standard accounting definition by allocating handling and other costs to the operation and maintenance category. Quite obviously, this has the effect of reducing those cost

factors by two-thirds (i.e. 90 percent of cost items versus 30 percent). While the incremental amount may be small, the recomputation resulting from this opinion should follow the Staff formula rather than Licensee's in this respect, and the cost of steam generation for comparative purposes will be computed as indicated above.

SUMMARY – VALUE OF REALIZED ENERGY GAINS

38. After making the adjustments noted above in connection with measurement of energy gains and applying the monetary values we have determined to be appropriate, the net value of energy gains realized for the years in question is as follows:

Year	Energy Gain kwh	Unit Value (Mills/kwh)	Total Value
1961	41,315,474	2.059	$ 85,069
1962	59,988,602	2.119	127,116
1963	86,948,617	2.076	180,505
	188,252,693		$392,690

CAPACITY GAINS

39. Benefits provided by a headwater improvement and assessable against a downstream project normally are expressed in terms of energy gains at the downstream hydro plant plus gains, if any, in the dependable capacity of such plants resulting from the upstream impoundment and

[4551]

water releases. The Glossary of Power and Rate Terms, prepared by the Inter-agency Committee on Water Resources, defines dependable capacity as "the load-carrying ability of a station or system under adverse conditions for the time

interval and period specified when related to the characteristics of the load to be supplied."[10] If the Federal Government's Allatoona project provided a gain in the dependable capacity at Weiss, Lay, Mitchell and Jordan, it would mean that Licensee would have been able to rely upon the increase in the dependable capacity for supplying a greater portion of the system peak load than would have been possible without the Allatoona project. The Examiner found that the dependable capacity was increased. We disagree and grant the exceptions on this issue taken by Licensee.

40. In making studies to determine gains in dependable capacity, the energy available from downstream plants under adverse flow conditions, both with and without the headwater improvement, may be fitted on a system load duration curve to determine the maximum capacity that could be utilized under each condition. This type of analysis was made by a company witness and a Staff witness. Both concluded that, even without upstream regulation by Allatoona, the available energy at downstream plants was adequate to make the generating capabilities of these plants fully dependable in serving the system load. The additional energy provided by Allatoona regulation, they found, provided no increase in dependable capacity during 1961, 1962 and 1963, but merely made it possible to operate the hydro plants at the same magnitude of capacity more hours per day.

41. The conclusions of Licensee's witness and of the Staff's witness were challenged by a witness sponsored by the Interior Department. Another Staff witness testified that there were gains in "peak period" capacity.

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[10] See *South Carolina Electric & Gas Co. v. F.P.C. supra*, at 901, where the court defined the dependable capacity of a hydroelectric project as "its load-carrying ability at the time of annual system peak load, assuming a recurrence of the most adverse stream flow conditions of record."

[4552]

The substance of their arguments is detailed in the Initial Decision and need be restated only in outline here. Interior's witness estimated the amount of energy that would be generated at Licensee's four downstream plants herein concerned from water drawn from storage at Allatoona during the months of June through August under critical flow conditions, which occurred in 1931. He then assumed that if such energy had not been available, an equivalent amount of energy would have been generated from release of storage at other hydroelectric plants on the Southern Company System,[11] thus causing a reduction in available head at such plants with resultant reduction in plant capabilities. In effect, the witness assumed that the "rule curve" for operating each of the storage hydroelectric plants on the Southern Company System would have been different if Allatoona had not been in operation. This is not a valid assumption. Hydraulic conditions or other factors in a particular river basin could dictate no change in the rule curve operation. The witness presented no evidence that such changes actually took place when Allatoon was initially placed in operation or at any time subsequent. Also, his finding of gains to the Southern Company System necessarily connotes that a portion of the gains was realized at plants of the Georgia Power Company and at plants of the Alabama Power Company other than those downstream from Allatoona. This evidentiary infirmity is noted by the Examiner. Not only are the dependable capacity figures shown by Interior questionable, they are not those realized by Licensee but,

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[11] As noted by the Examiner, Licensee is a subsidiary of the Southern Company and its generating and transmission facilities, along with those of its operating sister companies, Georgia Power Company, Gulf Power Company and Mississippi Power Company, are a part of a coordinated operation known as the Southern Company System. Under a power pool intercompany interchange contract, each of the four affiliated companies meets its load requirements by generation from its own plants, plus purchases from the pool less sales to the pool.

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Since Allatoona regulation undeniably enhances Licensee's generating resources, it receives a monetary benefit therefrom when shares of savings and benefits from the pool's operation are allocated among the member companies.

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rather, are those realized by the Southern Company System as a whole. No method has been provided, nor is one ascertainable, for assigning a proper share of the overall benefits to Licensee. The Examiner was correct in rejecting the study. The exceptions by Interior addressed thereto must be denied.

42. Staff's second witness, testifying in reubttal, relied upon extensive studies of peak-hour and peak-period capacity gains, and the net annual monetary value of the benefits accruing to Licensee under the power pool contract, attributable to the operations of the Allatoona reservoir during the years in question. The Examiner concluded that the capacity gains calculated in this fashion are subject to assessment under Section 10(f) of the Act in that they "fall within the definitions for dependable capacity." We find nothing in the record to support this bare conclusion. The Southern Company contract has as its primary purpose the sharing of savings and burdens among the pool members. This involves credits and charges for energy, peak-period capacity and peak-hour capacity. There is no way in this record for propertly separating these items from a determination of the total monetary benefit of all three items attributable to Allatoona regulation. While, on a more complete record, total monetary benefits under the pool contract might be considered an appropriate proxy, assuming the necessary rationale lacking herein was provided, to the results achieved under the usual practice of estimating the monetary benefits from gains in energy and dependable capacity, we perceive no way in which the two approaches can be combined in solving this problem.

43. If an assessment were to be made for peak-period minus peak-hour capacity, we would be saying, in effect, that even though there is no gain in dependable capacity there should be a charge related to capacity of there is an increase in the plant factor operation of the downstream plants. An increase in the annual plant factor operations generally occurs whenever headwater benefits are provided. In hydroelectric power evaluation studies we recognize that the plant factor at which a generating plant operates in a system may have an effect on system production costs so an appropriate adjustment is made. This is referred to as the "hydro-thermal energy value

[4554]

adjustment."[12] The adjustment is made to the *energy* component of the power value and not to the capacity component. A question arises as to whether an adjustment for this factor should be made in headwater benefit determinations in the calculation of the monetary value of energy gains. The answer is no since, in a headwater benefits study, only those plants of a system are included which would be most likely to produce additional energy in lieu of energy gains provided by the headwater improvement. Since the actual production costs of those plants are used, as is the case here, and since such actual costs generally fall within an intermediate cost range, no energy value adjustment for plant factor is needed.

44. Based on the foregoing, the Examiner's decision will be adjusted to eliminate the charge found for capacity gains.

EQUITABLE PORTION OF ALLATOONA COSTS ASSESSABLE AGAINST LICENSEE

45. Having determined that headwater benefits provided by Allatoona to Licensee's downstream operations are restricted to energy gains as adjusted above, payments under Section 10(f) are fixed through application of the formula

[4554]

identified in footnote 4. We conclude that the equitable portion of interest, maintenance and depreciation charges assessable against Licensee for the years in question is as follows:

1961	$66,070
1962	95,716
1963	126,081

for a three-year total of $287,867.

COST OF THIS DETERMINATION

46. As set forth in footnote 1, Section 10(f) of the Act provides that licensees "shall pay to the United

[12] See *Hydroelectric Power Evaluation*, Federal Power Commission, March 1968, pp. 23-25.

[4555]

States the cost of making such determination as fixed by the Commission." In its order of September 28, 1966, the Commission fixed this cost at $18,724, to cover the expense of studies and other actions to that date.

47. Following the hearing process instigated by Licensee, the Presiding Examiner assessed a charge of $29,212 ($18,724 as originally assessed, plus $10,488 in subsequent expenses) for determination costs through March 31, 1968. We are required to decide whether these added charges are properly due and to what extent, if any, expenses incurred since the Examiner's cutoff date should be added thereto.

48. The statute contains no precise criteria, either as to cost items properly included or time period covered; neither the Commission nor the courts have developed detailed formulae in this respect. There is ample precedent, however, for including costs of adjudication (hearing and Commission review) against a contestant Licensee. *Virginia Electric & Power Co., supra,* at 377. But the present proceeding dif-

fers from earlier situations in that the added Staff costs are only in part due to substantiation of headwater benefits originally claimed by Staff, assessed in 36 FPC 701, and approved herein; in substantial part, Staff costs incurred in the course of hearings and argument to the Commission subsequent to March 31, 1968 relate to charges for dependable capacity first raised at the hearing stage, and disallowed here.

49. While we think the cost data used by the Examiner were proper, it is impossible at this stage to allocate proportional amounts to original issues and those raised at a later date. For that reason and in the interest of equitable application of the statutory directive, we think it reasonable and proper to fix determination costs at some intermediate point, as was done with Commission approval in *South Carolina Electric & Gas Co., supra*, at 681.

50. On this admittedly judgmental basis, we think it appropriate to fix this charge at $30,000 for the entire proceeding, and will so order. This amount consists of that originally found by the Examiner, plus a rounding nominal charge for subsequent costs.

[4556]

ANCILLARY ISSUES

51. Licensee has further excepted to the admission in evidence of letters from corporate officers of original license applicants, relating to headwater benefits expected to be derived from Allatoona operations. We think that these statements are relevant and their admission wholly proper. However, there is little indication that they played any significant part in the Examiner's Initial Decision; they had no influence on the conclusions reached herein. The exceptions are accordingly denied.

51. Our review of the proceeding to date reveals no novel questions of law or policy that would benefit significantly

[4556]

from oral argument. Nor would the technical issues involved be elucidated in that process; they are set forth in an extensive and competent record and placed in sharp focus by the Examiner's Decision and subsequent briefs. Licensee's motion for oral argument will be denied accordingly.

The Commission further finds:

The Presiding Examiner's Initial Decision in this proceeding, as issued March 25, 1969, should be reversed or modified as to those points specifically so identified and detailed above, and the conclusions of this Opinion substituted therefor. As to all matters not discussed and reversed or modified herein, the exceptions entered by Licensee and Interior should be denied and the Examiner's Decision adopted as that of the Commission.

The Commission orders:

(A) As modified by the content of this Opinion, the President Examiner's Initial Decision is adopted and, together with this Opinion, shall constitute the Opinion and Order of the Commission.

(B) Alabama Power Company shall pay to the Federal Power Commission the net amount of $82,606 within 60 days from the date of issuance of this order. The amount found due consists of $287,867 as Alabama Power Company's equitable portion of headwater improvement costs for the period 1961-63, plus $30,000 as the cost of making this determination, less the interim payment of $235,261 pre-

[4557]

viously remitted.

(C) Licensee's motion for oral argument is denied.

(D) All exceptions not specifically granted by the terms of this Opinion and Order are denied.

By the Commission.

(S E A L)

Gordon M. Grant, Secretary

[4574]

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL POWER COMMISSION

Alabama Power Company Docket No. E-6893

APPLICATION FOR REHEARING OF ALABAMA POWER COMPANY

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[4575]

i

TABLE OF CONTENTS

Page

POINT I 1

POINT II 2

ARGUMENT 3

POINT I: THE REQUIREMENT THAT ALABAMA SPILL RELEASES FROM ITS OWN STORAGE RESERVOIR AND, INSTEAD, UTILIZE AND PAY FOR RELEASES FROM A FEDERAL RESERVOIR IS CAPRICIOUS AND IMPROPER . . . 3

A. Background 5

B. The Expectations of the United States 6

C. Recognition of Weiss Storage Releases Is Clearly Not An "Offset" 8

[4575]

D. Proper Computation of Energy Gains 9

POINT II: EXAMINATION OF THE APPLICATION OF THE VALUE FORMULA ACCEPTED BY OPINION NO. 569 REVEALS THE APPLICATION TO BE THEORETICALLY UNSOUND AND INEQUITABLE 13

A. Background 14

B. The Value Formula 16

C. Other Formulae Used by the Commission 17

D. The Value of Power At Site 19

E. The Application of the Formula 20

Conclusion to Point II 24

CONCLUSION 25

[4576]

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL POWER COMMISSION

Alabama Power Company — Docket No. E-6893

APPLICATION FOR REHEARING
OF
ALABAMA POWER COMPANY

On December 17, 1969, the Commission issued an Opinion and Order (Opinion No. 569) determining the amount which the Alabama Power Company (Alabama) should pay to the United States under section 10(f) of the Federal Power Act for benefits received at its hydroelectric projects on the Coosa River during the period January 1, 1961 through December 31, 1963, from streamflow regulation by the United States' Allatoona development. The Commission found that Alabama should pay the United States the sum of $287,867 for such benefits, plus $30,000 as the cost of making the determination. Pursuant to section 313 (a) of the Federal Power Act and section 1.34 of the Com-

mission's Rules of Practice and Procedure, Alabama respectfully files this Application for Rehearing of the aforesaid Opinion and Order, upon the following two grounds:

POINT I

Opinion No. 569 creates a new principle: namely, that once a licensed project receives benefits from storage

releases from a federal headwater development the owner of the licensed project shall continue to pay the United States for such benefits annually even though because of further developments in the basin, the licensed project no longer receives the benefits. The principle necessarily embodies an assumption as to the immutability of use of a water resource development from the time of its initial operation .

The Opinion holds that the United States ha a vested right to be paid for storage releases from Allatoona by the three downstream hydroelectric projects of Alabama which were in existence when Allatoona went into operation, even though, because of the later construction by Alabama of an intervening storage reservoir, the three projects cannot use all of the Allatoona storage releases without spilling Alabama's own storage releases. The fact that the total energy gains admittedly received by Alabama because of headwater reregulation at Allatoona increased in the years 1961-1963 because of benefits received at Alabama's new storage project, and will further increase for years after 1963 because of Alabama's additional investment in two existing projects and three new projects downstream from Allatoona, evidently does not affect the new principle.

Not only does the new principle require Alabama's customers to pay twice for the same energy, it also is inconsistent with sound river basin planning and operation as heretofore practiced by the United

[4577]

States and recognized in prior Commission federal rate regulation and headwater benefit Orders. Such Orders consistently have accepted the reallocation of federal project costs as further development of a river basin has changed the use of a project or a project's value for a particular use.

The new principle should be rejected, and the headwater benefit payment computed by Alabama accepted, in recognition of the fact that Alabama should be permitted to utilize its own storage releases at its own plants.

POINT II

To allocate equitably the section 10(f) costs of headwater storage reservoirs among hydroelectric plants which are benefited by the storage, the Commission has developed a series of formulae. Unlike the application of the other section

[4578]

10(f) formulae, which to date have produced over 75% of the headwater benefit payments to the United States without any litigated case reaching the Commission for decision, the application of the value formula–summarily reaffirmed in Opinion No. 569–has been a constant source of litigation. The theoretical basis for this application should be re-examined by the Commission, and the application revised to achieve the valid purpose of the formula.

ARGUMENT

POINT I

THE REQUIREMENT THAT ALABAMA SPILL RELEASES FROM ITS OWN STORAGE RESERVOIR AND, INSTEAD, UTILIZE AND PAY FOR RELEASES FROM A FEDERAL RESERVOIR IS CAPRICIOUS AND IMPROPER.

A first step traditionally taken by the Federal Power Commission, pursuant to section 10(f) of the Federal Power Act and section 11.27(b) of its regulations, in order to equitably apportion to a licensee annual charges for interest, maintenance and depreciation on storage dams and reservoirs owned by the United States, the releases from which have benefited the licensee, has been to ascertain the power benefits received by the licensee from the storage releases. This has traditionally been accomplished by determining the *actual* generation at a licensee's plants and *computing* what the generation would have been if the federal storage reservoir had not been located upstream. If the actual generation is greater than the computed generation, there is a positive benefit. If the actual generation is less than the computed

tion is greater than the computed generation, there is a positive benefit. If the actual generation is less than the computed generation, there is a negative benefit.

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The initial Staff Report in this proceeding, dated March 1965, departed from this traditional procedure to the extent of apportioning the credit for energy benefits at Alabama's three downstream hydroelectric projects between Alabama's own upstream storage reservoir (Weiss) and the federal storage reservoir (Allatoona). The report stated:

> "* * * under certain flow conditions, when the hydraulic capacity of a plant [Lay, Mitchell or Jordan] is exceeded, the benefits have been apportioned on

[4579]

> the basis of the total volume of daily regulation at both reservoirs [Weiss and Allatoona]" (at 10)

This procedure denied Alabama full credit for its own investment in headwater storage and required Alabama customers to pay the United States for some energy that Alabama, without assistance, was already able to provide them.

When Alabama pointed out certain technical errors in the Staff Report, however, the Report was first revised to correct errors and then completely changed in the instant regard. Instead of even apportioning credit for benefits at the three downstream plants between the two upstream reservoirs, it in effect removed Alabama's storage reservoir from the stream. The amended report states:

> "Daily flows *adjusted to eliminate the effect of regulation by Weiss* [Alabama's storage reservoir] are used in the computation of energy gains at Lay, Mitchell, and Jordan [Alabama's plants] attributable to Allatoona [the federal project] regulation." (Emphasis supplied.)

This new method, which requires Alabama's customers to pay the United States for all the energy gains which the United States was

[4580]

capable of providing even though it did not provide them, has been adopted in Opinion No. 569. Its adoption creates a falacious new principle which, if expressed in terms of a bus rider, requires a former bus rider to continue paying the bus fare even after he buys a car and stops riding the bus. The new principle necessarily is based upon a completely false premise: that the use of a water resource development does not change after its initial date of operation.

A. *Background*

Section 2 of the River and Harbor Act of March, 1945, P.L. 14, 79th Cong., 1st Sess., authorized the federal development of undeveloped sites in the Alabama-Coosa River System. At that time Alabama's Lay, Mitchell and Jordan hydroelectric projects were already in existence.

Construction was started on the first federal development —the Allatoona project—shortly thereafter. Allatoona went into commercial operation in 1950 and, by its storage releases, started providing energy gains at Alabama's three downstream projects. Alabama started paying for these benefits as they were assessed. By early 1962, it had paid for these benefits through 1960. In fact, payments by Alabama for benefits from Allatoona constituted over 80% of the total of headwater benefits collected by the United States pursuant to section 10(f) for all federal storage developments at that time.

On June 28, 1954, Congress enacted Public Law 436 which

[4581]

suspended the federal preemption of the remaining sites on the Coosa River in order to permit development of the sites by non-federal interests under license from the Federal Power Commission. The first non-federal development to be placed into operation after passage of the 1954 Act was Alabama's Weiss project, in 1961. Subsequently Alabama has placed in operation the H. Neely Henry project, the Logan Martin project, and the Walter Bouldin project. In addition, Alabama has raised the height of Lay reservoir by 14 feet, and the height of Jordan reservoir by 7 feet.

Additional Federal projects constructed or under construction in the basin include the Claiborne (no power), Carters, Jones Bluff and miller's Ferry developments.

It is against this background of continuing river basin development that the principles and assumptions of Opinion No. 569 must be considered.

[4581]

B. *The Expectations of the United States*

The Opinion suggests that the authorization of the Allatoona project was somehow *dependent* upon a certain level of headwater benefit payment from the three Alabama plants then in existence. What level of payment? How was it determined in 1945? There is no evidence in the record to support the suggestion of Allatoona dependence, which is now made for the first time over twenty years later, or the level of payment. If there were such evidence, would the expectation create a vested right? Or even an equitable right?

[4582]

If the level of payments anticipated in 1945 can be established, will it create an upper limit on payments for Allatoona storage by Alabama? Because of its development of three additional projects (which, of course, it was preempted from building in 1945) and its redevelopment of two of the earlier projects, Alabama now stands in a position where it may be assessed much more for Allatoona storage than could have been anticipated in 1945. Even when Alabama is permitted to utilize its own investment in Weiss storage, Alabama's energy gains from Allatoona storage are increased over what could have been anticipated in 1945 because of its additional projects.

It is known that, in 1945, Congress expected Allatoona to be just an early step in the comprehensive development of the Alabama-Coosa River System. See H. Doc. No. 308, 69th Cong., 1st Sess.; H. Doc. No. 66, 74th Cong., 1st Sess; Resolutions of the House Committee on Rivers and Harbors of 1 April 1936 and 28 April 1936 and of the Senate Committee on Commerce of 18 January 1939; and H. Doc. No. 414, 77th Cong., 1st Sess.

What is further known is that the actual form of the anticipated comprehensive development has been continually changed by the Corps of Engineers, by the Federal Power

Commission and by Congress, as conditions in the river basin have changed, as desirable uses of the water resources have changed, and as power loads have developed.

What is true about the Alabama-Coosa River System is true about the other river basins in the country. *As additional projects are added*

[4583]

in a river basin and as conditions change, the requirements for storage for flood control, irrigation, low-flow augmentation, recreation or power often change at particular projects. When such changes occur, the capital costs of the project are reallocated to reflect the changed use *in order that a particular use shall not continue to bear the annual charges of facilities no longer serving it.* The Federal Power Commission Orders in connection with regulation of the rates of federal projects and in headwater benefit determinations heretofore have accepted many such reallocations.

This same principle should apply here. Alabama's three original projects no longer receive the same benefits from storage at Allatoona, since the construction of the Weiss development by Alabama. At the same time, because of an increase in head at two of the original projects and the addition of three new projects, energy gains from Allatoona storage at Alabama's downstream plants have increased. Who is hurt if the actual facts are recognized? Alabama's customers are hurt if they are not. This hurt derives from the adjustment of actual daily flows "to eliminate the effect of regulation by Weiss *** in the computation of energy gains at Lay, Mitchell, and Jordan."

C. *Recognition of Weiss Storage Releases Is Clearly Not An "Offset"*

The Weiss project now provides a portion of the headwater benefits to Lay, Mitchell and Jordan, which were previously being furnished by Allatoona. In objecting to the proposition that it should

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C. *Recognition of Weiss Storage Releases Is Clearly Not An "Offset"*

The Weiss project now provides a portion of the headwater benefits to Lay, Mitchell and Jordan, which were previously being furnished by Allatoona. In objecting to the proposition that it should

[4584]

continue paying Allatoona for benefits no longer received. Alabama seeks to avoid having its ratepayers bear the cost of paying for the same benefits twice. The Company is *not*, as was the situation in each of the three cases cited by the Commission,[1] attempting to obtain a credit or an offset for benefits which it and its ratepayers may be providing *to others*. In those cases, licensees sought credit for providing reregulation of releases from federal dams and for other benefits to the public. In this case the licensee seeks recognition only of the fact that it is providing certain benefits *to itself*. The Commission's characterization of the Company's position on this matter as a claim for an offset is therefore plainly inaccurate, and its quotation of Judge Bryan from a case which did involve an offset claim is conspicuously irrelevant.

D. *Proper Computation of Energy Gains*

Alabama's witness followed the procedure approved by the Commission in the first *South Carolina* case, 29 FPC 624, by the Circuit Court in the same case, 338 F.2d, at 904, and by the Commission in the *VEPCO* case, 37 FPC 340, to determine energy gains from the federal headwater regulation. He determined actual generation at Alabama's plants and then computed the generation which

[1] *Alabama Power Company*, 34 FPC 971 (1965); *South Carolina Electric and Gas Co.* v. *F.P.C.*, 338 F.2d 898; *Virginia Electric and Power Co.*, 37 FPC 340 (1967).

[4585]

would have been available if the Allatoona development were not in existence. On this basis, he determined that energy gains at Alabama's projects from Allatoona storage releases, before adjustment for evaporation, were 154,493,773 kilowatt hours.[2] This compares with an energy gain of

111,229,125 kilowatt hours in the preceding three years, before Weiss was in operation. 27 FPC 398, 399.

Staff, on the other hand, contrary to its methodology in the first *South Carolina* and *VEPCO* cases, ignored actual generation at the

[2] In order to arrive at a figure for the computed generation at the Company plants in the absence of Allatoona, it was necessary to make a number of fundamental assumptions, one of them being that water not needed for generation at Weiss would normally be stored at Weiss for later use when stream flow conditions warranted, as is the case today. A company witness supplied a detailed account of how such storage could and, in his judgment, would be used in the absence of Allatoona. For a basis by which to guide his calculations as to the daily use of Weiss flood storage, the Company witness assumed that the current operating rules of the Corps of Engineers dealing with flood control operations at Weiss would be applicable. Since the current operating rules actually provide for the independent operation of Weiss and Allatoona during the rising phase of any flood, it seemed especially appropriate to base the assumed operation of Weiss on those rules.

The statement in the Commission's Opinion that the Company contests the Examiner's conclusion that there is coordination between the operation of Allatoona and Weiss is wholly inaccurate and has resulted in a serious misunderstanding of the Company's position.

It is an unchallenged fact that Weiss has flood storage, which was installed, and paid for by licensee, and which in the absence of Allatoona would be used further to enhance power production both at Weiss and at the three downstream plants. The position of the Staff that it is improper to assume any use of such storage, because the precise operating rules which would apply are unknown, is simply untenable, since such storage is actually being used for this purpose already.

[4586]

Weiss, Lay, Mitchell and Jordan projects. Instead, in computing the generation at Weiss, both with and without Allatoona storage. Staff intentionally disregarded the *actual* generation at Weiss from Weiss' own flood control storage. In computing the generation at Lay, Mitchell and Jordan with and without Allatoona storage, Staff intentionally dis-

[4586]

regarded the *actuality* that Weiss was reregulating the river. Using Staff's novel methodology, Opinion No. 569 derives energy gains at Alabama's four projects of 188,252,693 kilowatt hours. The difference of 33,000,000 kilowatt hours between Opinion No. 569 and Alabama's calculations is 17.5% of the larger sum.

Opinion No. 569 adopted Staff's method.[3] In doing so, it requires

[3]It should be noted that the Opinion also adopted further Staff methodology requiring another radical departure from reality. In determining the alternate cost of energy, Staff adopted a principle of allocating generating plants to load centers. This principle is even more unrealistic on the Alabama system today than it would have been in 1950-1960 when Alabama's "pattern of generation" method was specifically advocated by Staff as appropriate to determine alternate costs.

There is at the end of a year on the Alabama system an established pattern of generation which resulted from the operation of the system to take into account reliability, availability of resources, transmission and economy dispatch. There is every reason to assume that the generation to supply increments of load occurring at random times over that yearly period would have followed that same pattern. Staff's selection of three plants not dictated by the established pattern of generation, on the other hand, is completely arbitrary. The capriciousness is compounded by assigning one-third of the energy gains to each plant, when the undisputed record shows that the plant that had the lowest costs of the three was available to supply much more than one-third of the energy at the time the energy gains were realized.

[footnote continued on next page]

[4587]

Alabama's customers to pay an increment over and above Alabama's actual costs to produce the 33,000,000 kilowatt hours in question. This increment can only be considered as an additional tax being imposed by the United States on Alabama's customers, because it is clear they receive no direct benefit from the payment. Such a charge is arbitrary and inequitable.

It has been urged at times in the past, and, in fact, section 11.31(c) of the Commission's regulations seem to imply, that, so long as the total payment for headwater benefits required of a licensee does not exceed the total value of energy gains at licensee's plants, a licensee has no right to complain. This is like saying that a customer of licensee, while entitled to pay taxes, is somehow a second class citizen.

The personal taxes paid by a customer of Alabama go towards the payment of non-power costs at federal projects, which has the effect of reducing the cost of power to power purchasers from such projects. In addition to corporate taxes which also go towards such costs of federal projects, in his power bill Alabama's customer pays costs of flood control, recreation, water quality control and many other benefits

[footnote continued from preceding page]

It should be noted that the only case that has departed from the "pattern of generation" method is the *VEPCO* case, where, without any dispute, a single plant was agreed upon by all parties as the source of energy gains. It should be noted further that Staff took no exception to the Examiner's adoption of Alabama's "pattern of generation" method.

[4588]

furnished the public without charge by Alabama's licensed hydroelectric projects. He receives no credit for these public benefits to offset against headwater benefit payments and no credit even for direct services to federal projects, as noted in the cases cited in footnote 1. These facts, combined with the equity standard of section 10(f) of the Federal Power Act, require that a customer of Alabama be ordered to pay no larger share of the interest, maintenance and depreciation on a federal storage dam and reservoir than is required to be paid by a power customer served by the federal project for similar benefits.

The calculation of energy gains adopted by the Opinion, since it intentionally exaggerates such gains over the actual

[4588]

facts, requires Alabama's customers to pay a disproportionate part of the appropriate costs for benefits received. This matter, and the matter covered under Point II, unless corrected, will result in an unlegislated discrimination by the United States between customers of Alabama and customers of the federal Allatoona development.

POINT II

EXAMINATION OF THE APPLICATION OF THE VALUE FORMULA ACCEPTED BY OPINION NO. 569 REVEALS THE APPLICATION TO BE THEORETICALLY UNSOUND AND INEQUITABLE

To allocate equitably the section 10(f) costs of headwater storage reservoirs between hydroelectric plants which are benefited by the storage, the Commission has developed a series of formulae. Unlike

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the application of the other section 10(f) formulae, which to date have produced over 75% of the headwater benefit payments to the United States without any litigated case reaching the Commission for decision, the application of the value formula—summarily reaffirmed in Opinion No. 569—has been a constant source of litigation. The theoretical basis for this application should be re-examined by the Commission, and the application revised to achieve the valid purpose of the formula.

A. *Background*

Through fiscal 1962, the Commission had ordered licensees to pay a total of $587,088 to the United States for power benefits received at licensed projects because of water stored and subsequently released at upstream federal water developments. 42 FPC Ann. Rept. 67, 142. Of this amount Alabama had paid $482,031, or over 80% for benefits received through 1960 at three of the plants under considera-

tion in this proceeding. 13 FOC 1317; 16 FPC 827; 22 FPC 749; 27 FPC 398.

On June 4, 1962, an initial decision was issued determining the headwater benefit payment due the United States for storage releases from the federal Clark Hill development which resulted in energy gains from 1953 through 1955 at the Stevens Creek project owned by South Carolina Electric & Gas Company, Docket No. E-6468, 29 FOC 631 through 683. After oral argument on January 7, 1963, the Commission modified and adopted the initial decision on March 28, 1963, 29 FPC 624. In doing so, the Commission accepted the application of the value

[4590]

formula here in issue, finding that the Company's alternative method of computing the payments was "fundamentally defective because of its numerous unrealistic and unsupportable assumptions, including the postulating of two hypothetic head and storage function dams, * * *." 29 FPC at 630. The Commission's decision was affirmed at 338 F.2d 898 (1964).

Meanwhile, on August 24, 1962, the Commission had issued a notice of proposed rulemaking in connection with formulae and procedures to be used in future headwater benefit determinations, 27 F.R. 8744. On April 23, 1963, by Order No. 268, it adopted new regulations which are now set forth without change at sections 11.25 through 11.30, 29 FPC 818. While the new regulations at section 11.27 recognized three different types of headwater benefit situations, and adopted a formula in regard to one of them, they did not adopt the South Carolina formula or its application in the Commission's Order of a month earlier.

For periods subsequent to those covered in the initial *South Carolina* case, because of a change in circumstances, a staff report applied to South Carolina's Stevens Creek project the formula set forth in the regulations. Thereafter,

[4590]

agreement was reached on all payments subsequent to 1955 and accepted by Commission Order. *South Carolina Electric & Gas Company*, Docket No. E-6468, issued August 19, 1968. The issue of the application of the instant formula did not arise.

The application of the formula was before the Commission again, however, in *Virginia Electric & Power Company*, Docket No. E-6684,

[4591]

37 FPC 340 (1967), the only other litigated headwater benefits case yet to reach the Commission. VEPCO also suggested an alternative because of the inequity of the same application of the value formula. The Commission also rejected VEPCO's alternative.

Meanwhile, however, literally millions of dollars in payments—over 75% of total payments—have been made by licensees under other formulas, without litigation.

Alabama presents the issue of the inequity of the *application* of the value formula to the Commission for the third time: this time, however, without any attempt to allocate costs at the headwater dam and reservoir between its "head" and "storage" functions, as was attempted in the two earlier cases and as is done in the single formula adopted by the regulations. Instead, Alabama asks the Commission to look solely at the *application* of the formula accepted in this case and to correct that application. Alabama understands that there is at least one other major headwater benefit investigation pending in which the same issue arises.

B. *The Value Formula*

The value formula used in this case is intended to apportion the statutory 10(f) costs (interest, maintenance, and depreciation) allocated to power at the headwater dam and reservoir in the ratio of the value of power benefits received from the development, both at site and at downstream plants. This rationalization of the formula has been

[4592]

repeatedly expressed by the Commission and its staff and, for the purposes of this petition, is accepted as an appropriate basis on which to determine headwater benefits deriving from the federal Allatoona development.

It can readily be seen that, under the formula, if the downstream power benefits (in this case energy gains as a result of the upstream storage) are undervalued, the downstream plant or plants will not pay a fair proportion of the section 10(f) costs. Similarly, if the value of power calculated for the plant at the site of the headwater improvement does not encompass all power values, the downstream plant owners will be required to pay more than their fair share under the formula. It is the latter situation which Alabama claims results from the *application* of the formula used in this case.

To aid in understanding the problem Alabama believes it would be helpful to look first at the other formulae used by the Commission.

C. *Other Formulae Used by the Commission*

The formula spelled out in section 11.27(a) of the regulations, a variant of which has also been used by the Commission under section 11.27(b) of the regulations under which the value formula is also used, uses a different approach than the value formula. It first apportions the costs of the headwater improvement allocated to power between head and storage. The rationale of this approach has been stated by the Commission as follows:

[4593]

> The dam and reservoir facilities at a headwater improvement project provide two power functions. The first is a regulatory or storage function, which is beneficial to the at-site power plant and each power plant downstream. The second is a head

[4593]

> function, which is beneficial to the at-site power plant only. Therefore, in this study, the annual cost of interest, maintenance, and depreciation—subsection 10(f) costs—pertinent to the dam and reservoir of each headwater improvement project, to be borne by power both at site and downstream, is apportioned to storage and head functions. * * * Since, as previously noted, the head function provides only at-site benefits whereas the storage function provides both at-site and downstream benefits, the cost allocated to the storage function is the cost to be apportioned among the projects, at site and downstream. 31 FPC 1044, 1046-7.

As the Commission properly points out, the headwater dam and reservoir have an added value at site which they do not have downstream: namely, the head required to permit the generation of electricity from falling water. It is a capacity value. The release of water from storage at the headwater improvement in no way adds to this type of capacity value at downstream plants.

It was probably because of this recognized distinction in the value of the headwater improvement at site and downstream that, in complaining about the application of the value formula, both South Carolina and VEPCO attempted by different means to reduce the 10(f) costs to be apportioned based on the distinction.

The different approaches of the formulae, however, can be rationalized. In testimony filed by staff in Docket No. E-6384, noted by the Commission at 35 FPC 213, which never went to hearing, the interrelation of the two approaches was described as follows:

[4594]

> "* * * You will note that under the *South Carolina* method the dollar value of power produced at the headwater improvement was a complete measure of power benefits at site (all energy and dependable capacity attributable to the dam and reservoir to be

> borne by power). You will also note that under the method which we have used in Exhibit No. 1 the energy gains at the headwater improvement are only a partial measure of the power benefits at site (other benefits are dependable capacity and other energy produced [from natural flow]). Using only a partial measure of power benefits at site would result in a larger apportionment of 10(f) costs to the downstream owners. To offset this effect, an apportionment was made between the storage and head functions provided by the dam and reservoir, such apportionment being based on the energy which could be associated with each of those functions. The section 10(f) costs allocated to the storage function were then further apportioned among the projects, at site and downstream.
>
> In other words, under the *South Carolina* method a smaller proportion of a larger amount is distributed to downstream projects, while under the method used in Exhibit No. 1 a larger proportion of a smaller amount is distributed to downstream projects." Prepared testimony of Neal C. Jennings at pp. 21-22 in Docket No. E-6384, culminating in Order Approving Headwater Benefits Payments, issued June 16, 1966.

The above quotation emphasizes the necessity that all values of power at site must be included in the value formula if there is to be an equitable allocation of the larger amount of total 10(f) costs of the dam and reservoir allocated to power. The witness, however, incorrectly assumed that in the application of the value formula in the *South Carolina* case, the value used "was a complete measure of power benefits at site."

D. *The Value of Power at Site*

It has been decided that in considering the value of power at a

[4595]

federal project it is reasonable to equate value with cost. This issue was considered by the Circuit Court in the *South Carolina* case. 338 F.2d, at 905.

For this reason, the value of power at the site of a federal project was described as follows by the Examiner in the *South Carolina* case:

> "At the Clark Hill plant [the federal headwater improvement] the value to the government of the at-site power is determined on the basis that the value of power is equivalent to its cost.
>
> "The value, Staff witness said, of Clark Hill power is equivalent to its cost because the power is marked [sic] and sold at rates equivalent to the power costs." (29 FPC at 668)

It would appear then that the cost of all facilities allocated to power at the federal project would be the appropriate value of power for use in the formula. This figure, however, has not been used in the application of the formula about which Alabama is complaining.

E. *The Application of the Formula*

In the application of the formula accepted by the Commission in the first *South Carolina* case, in the VEPCO case and in this case, the value of power at the federal headwater development is first ascertained as noted above. All costs allocated to power at the headwater improvement are ascertained.

From this total value of power, however, are then deducted all costs associated with the specific power facilities, leaving only the

[4596]

costs of the dam and reservoir. For this reason the value of power at the federal project inserted in the formula is

only the 10(f) costs of the dam and reservoir (the cost to be apportioned) plus a minor increment for operation and insurance. Instead of the total value of power at the federal headwater improvement being used in the formula, a figure representing in the average case only 45% to 55% of the value of power is utilized.

This application has been justified on the grounds that, instead of being an apportionment of the 10(f) costs based upon the value of increased power resulting from development of the federal project, the formula is one to determine the value of the dam and reservoir to power at site and downstream, and, since value is equated to costs at a federal project, only the costs of the joint-use facilities should be included as the value of power at site. It is this application of the formula which has cuased the disputes. A concise rationalization of this approach from the Staff Report on the White River Basin is as follows:

> "*Value of power produced at Table Rock.* The average annual at-site value to the United States of power produced at the Table Rock project is considered to be equal to the total average annual cost of power at the project. Total annual power costs are the sum of the total annual costs of specific power facilities and the total annual cost of joint-use facilities to be borne by power. Specific power facilities are of value to the at-site plant only, whereas joint-use facilities provide benefits both at site and downstream. *For this reason it is the average annual cost of joint-use facilities allocated to power which represents the value of at-site*
>
> [4597]
>
> power . . . to be used in apportioning annual charges of the headwater improvement to at-site power production. [1963 Report at 15-16; emphasis supplied][4]

The portion of the quoted statement beginning with the words, "For this reason", is obviously a non sequitur. If

[4597]

the annual value of the power at the upstream federal Table Rock project is equal to the total annual costs of (1) specific power facilities and (2) joint-use facilities to be borne by power, as the first two sentences in the above quotation state, the value of the upstream (at-site) power cannot be anything less. To take a lesser value destroys the equitable sharing of 10(f) costs in the proportion of benefits received, which is the equitability standard underlying the *South Carolina* 11.27(b) formula. Looked at in another way, since there is no apportionment between head and storage under the value formula, to use less than the full value of power at site makes the downstream project pay a portion of the head costs which have value only at site.

One way to point up the inequities is to refer again to the *South Carolina* cases. In the first case, the litigated one, all of the 10(f) costs allocated to both the storage and head functions were apportioned on the basis that the value of federal power at site was equal to those same 10(f) costs plus operation and insurance. The downstream plant

[4] A similar statement is found in the Staff Report on Investigation of Headwater Benefits Coosa River Basin, January 1, 1961 through December 31, 1963, Docket No. E-6893, Revised April 1965, at 16-17.

[4598]

received no capacity benefits. The only benefits were found to be energy which was not dependable on peak, and the result of the application of the formula was that the downstream project paid 3 mills per kilowatt hour for the storage function of the upstream reservoir. The federal headwater project, however, received *235 kilowatts of capacity* plus energy associated with making that capacity dependable on peak at *a total cost* to it for the head and storage functions of the dam and reservoir of 2.68 mills per kilowatt hour.[5]

In the second *South Carolina* case, where the formula set forth in the Regulations at 11.27(a) was used by the Staff for the later years, the Staff allocated over 80% of the 10(f)

costs of this same headwater improvement to the head function which has a value only at the site of the headwater improvement. The remaining 20% of the 10(f) costs

[5] If the total value of power at the site of the federal headwater improvement had been included in the application of the formula in the first *South Carolina* case, the downstream project would have been required to pay approximately 1.8 mills per kilowatt hour for the energy gains at its project. Customers of the federal project would have been required to pay on an energy only basis approximately 2.73 mills per kilowatt hour for energy associated with 235 kilowatts of dependable capacity, or, if the payment were apportioned 50% to capacity and 50% to energy, a charge of $6.76 per kilowatt and 1.37 mills per kilowatt hour. Certainly the result of using the total value of power at the federal project to apportion the 10(f) costs of the dam and reservoir would have led to a more equitable result, even though it still would have favored the customer of the federal project.

The energy production at Allatoona from 1961 through 1963 is not available in the record for the purpose of making a similar comparison.

were allocated on the basis of critical period energy gains at site and downstream. The formula worked out so that—before application of any limit on value such as has been associated with use of this formula—the same downstream plant was to pay towards the cost of the joint-use facilities at the headwater improvement 1.28 mills per kilowatt hour for *critical period energy gains*, less than 50% of the 3 mill per kilowatt hour contribution required for random energy gains in the first *South Carolina* case under the application of the value formula complained of here. (Computed from Staff Report on Headwater Benefits Investigation, Savannah River Basin, January 1, 1956, through December 31, 1965, dated August 1966, at page 23.)

Conclusion to Point II

The application of the value formula accepted in the first *South Carolina* case, when the Commission found no viable

[4599]

alternative methodology presented to it on the record, should not be perpetuated. The results which it produces are inequitable and an unfair burden on the customers receiving power from the downstream plants. Many persons have not realized just how the formula has been applied: even, perhaps, the Staff witness quoted above ["You will note that under the *South Carolina* method the dollar value of power produced at the headwater improvement was a complete measure of power benefits at site"]. It is clear that, if the value formula is to be equitable and fair, all of the value of power at the site of the federal headwater improvement and not a fraction of that value should be used in its application.

[4600]

CONCLUSION

Alabama believes its positions on both Points I and II, above, are sound and that, if they are adopted, Alabama's customers will be required to pay for the benefits they receive from the federal Allatoona dam and reservoir amounts reasonably in proportion to the amounts customers served by the Allatoona project pay for the benefits they receive from the dam and reservoir.

If Opinion No. 569 is reaffirmed, Alabama believes that the effect will be an unjust discrimination against the Company and its customers. For these reasons it urges rehearing.

Respectfully submitted,

Debevoise & Liberman
Attorneys for Alabama Power Company

/s/ Thomas M. Debevoise
Shoreham Building
Washington, D. C. 20005

January 16, 1970

[4601]

VERIFICATION

United States of America
District of Columbia ss:

Thomas M. Debevoise, being first duly sworn, deposes and says: That he is an attorney for the Alabama Power Company, that he has read the foregoing application for rehearing and knows the contents thereof, that the same are true to the best of his knowledge and belief.

/s/ Thomas M. Debevoise

Subscribed and sworn to before me this 16th day of January, 1970

/s/ Margaret C. Abell
Notary Public, D. C.

[Seal]

[Certificate of Service]

[4607]

UNITED STATES OF AMERICA
FEDERAL POWER COMMISSION

OPINION NO. 569-A

Alabama Power Company Docket No. E-6893

OPINION AND ORDER DENYING APPLICATIONS FOR REHEARING AND MOTIONS FOR STAY AND ORAL ARGUMENT

Issued: February 11, 1970

[4608]

UNITED STATES OF AMERICA
FEDERAL POWER COMMISSION

ANNUAL CHARGES (Headwater Benefits)

Before Commissioners: John N. Nassikas, Chairman;
Lawrence J. O'Connor, Jr.,
Carl E. Bagge,
John A. Carver, Jr., and
Albert B. Brooke, Jr.

Alabama Power Company — Docket No. E-6893

OPINION NO. 569-A

OPINION AND ORDER DENYING APPLICATIONS FOR REHEARING AND MOTIONS FOR STAY AND ORAL ARGUMENT

(Issued February 11, 1970)

CARVER, Commissioner:

1. On December 17, 1969, the Commission issued Opinion No. 569 in the above-captioned proceeding determining the obligation of Alabama Power Company to the United States for headwater benefits received by its hydroelectric plants in the Alabama portion of the Coosa River Basin during the years 1961-1963. Applications for rehearing and modification of the Opinion and Order have been filed by The Secretary of the Interior and by Alabama Power Company. In addition Alabama Power Company filed motions for stay of the date set for the payment due under the Opinion and Order until after the Commission order on rehearing[1] and for an opportunity to present oral argument on the grounds for rehearing advanced in its application.

2. On consideration of the applications for rehearing we have determined that the specifications of error claimed therein should be denied and the Opinion and Order issued

previously in this proceeding confirmed. Oral argument is neither needed nor desirable. The motion for stay is moot since this supplemental

[1] Ordering paragraph (B) requires the payment to be made by February 16, 1970.

Opinion and Order is issued prior to the date set for effecting payment. The time limit within which payment is to be made will be extended, however, to 60 days after the date of this Opinion and Order.

3. Considering the applications seriatim, we find that most of the specifications of error advanced by Interior are answered in the Opinion. A few additional comments may be in order. Interior contends that the additional firm energy at the Coosa plants attributable to Allatoona regulation of flows permitted storage reservoirs of both Alabama Power Company and Georgia Power Company to store an equivalent amount of water which was used in a revised project operation to produce additional firm energy with increased capabilities, thus increasing system dependable capacity. However, the record contains no support that this was actually done, or that it should have been done.

4. Interior claims that the information reported in Schedule 2 of Form 12 may have been reported in terms of peak-period capacity plus peak-hour capacity rather than dependable capacity. This is speculative at best since there is no evidence to support the assertion. The Company's witness and Interior's witness both used data from Schedule 2 in their studies of dependable capacity. A company witness confirmed that the data was used in system planning to determine dependable capacity of the Southern System. There is no reasons to believe that the data in Schedule 2 has not been reported in accordance with the instructions in Form 12.

[4609]

5. A Staff witness presented system load duration curves but omitted therefrom certain firm Federal hydroelectric power purchased by an operating subsidiary of the Southern System. This deficiency was cured when a company witness introduced as Exhibit 52 load duration curves which included such purchased power. This same exhibit shows that a surplus of hydroelectric energy would have existed even if no additional firm energy were available from Allatoona regulation and that it was not necessary to change the operation of the storage reservoirs because of a shortage of energy to meet system load requirements.

6. Interior asserts that the Company's presentation was deficient in that it did not produce the planning load curves

[4610]

prepared by the Southern Company which projected the 1961, 1962 and 1963 loads and how the system planned to meet them. Planning load curves, as opposed to after-the-fact actual load curves, might be relevant and useful in a study of possible gains in dependable capacity but are not essential. There is no indication that such curves were ever prepared by the company. More importantly, there is no reasons why load duration curves based on actual loads should not be used in a determination of dependable capacity for a past period. Indeed, the use of actual load data is the normal practice in these studies.

7. Interior also raises the question of whether a project must be downstream from the headwater reservoir to be directly benefited as contemplated by Section 10(f) of the Federal Power Act. In Opinion 569 we found that the dependable capacity figures shown by Interior were those realized by the Southern Company System as a whole, rather than solely by the Licensee, and that there would be no method for assigning a proper share of the overall benefits to Licensee. Since we have found that Allatoona regulation provided no gain in dependable capacity in fact, the question raised is academic in this case. Without deciding

the question we may note that with the trend to coordinated operation of electric systems on a regional basis, the complexity of headwater benefit determinations would be increased greatly if the benefits to be assessed under Section 10(f) are not limited to downstream projects.

8. Interior requests that the present proceeding be consolidated in a further hearing with a pending headwater benefit proceeding involving the Buford project of Georgia Power Company where dependable capacity benefits will again be an issue. We are advised by Staff that studies on the Buford project are under way. Interior will have ample opportunity to review those studies and provide studies of its own if it chooses to do so. Based on our determinations in this proceeding, we preceive no merit in combining the proceedings at this time.

9. Alabama Power Company excepts to our disallowance of the storage and release capability of the Weiss Reservoir in the calculation of energy gains derived from the Allatoona Dam. The issue was fully considered in the Opinion. Licensee's arguments are little more than restatements of its previous contentions which have been considered and rejected. No basis exists for a modification of our holding.

[4611]

10. Licensee also contends that the application of the value formula used in apportioning the Section 10(f) costs of Allatoona allocated to power between the headwater improvement and Licensee is unsound and inequitable. Licensee asserts that the cost of all facilities allocated to power at the Federal project is the appropriate value of power to be used as the Vf component in the formula, and that this amount should include the specific power facilities. This same argument was considered at length by the Examiner and rejected in his finding that "No portion of the cost of special [specific] power facilities has been included in the total 10(f) costs (Cp) and therefore special facilities costs cannot be included in the cost which is intended to measure

the benefit received by Licensee from such 10(f) costs." Licensee's exception (No. 8) specifically was denied in the Opinion. Its continued exception here is not convincing.

The Commission finds:

The assignments of error and grounds for rehearing set forth in the applications for rehearing filed in this proceeding present no facts or legal principles which would warrant any change in or modification of the Commission's Opinion No. 569 and accompanying Order.

The Commission orders:

(A) The applications for rehearing filed by The Secretary of the Interior and by Alabama Power Company in this proceeding are denied.

(B) The motions for stay and oral argument filed by Alabama Power Company are denied.

(C) The time limitation specified in Ordering Paragraph (B) of Opinion No. 569 is extended to 60 days from the date of issuance of this order.

By the Commission.

(SEAL)

Gordon M. Grant,
Secretary.

In The

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 24067

ALABAMA POWER COMPANY,
Petitioner

v.

FEDERAL POWER COMMISSION,
Respondent

On Petition for Review of Order
of the Federal Power Commission

BRIEF FOR PETITIONER, ALABAMA POWER COMPANY

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TABLE OF CONTENTS

Page

STATEMENT OF THE ISSUES 1

STATUTE INVOLVED 3

REFERENCES TO RULINGS. 3

STATEMENT OF THE CASE. 4

Background 5
Headwater Benefit Determinations. 8

ARGUMENT
Point I
THE COMMISSION VIOLATED THE MANDATE OF SECTION 10(f) OF THE FEDERAL POWER ACT, WHICH REQUIRES CHARGES TO BE ASSESSED AGAINST A LICENSEE "DIRECTLY BENEFITED," BY ASSESSING CHARGES AGAINST ALABAMA FOR ADMITTEDLY FICTITIOUS BENEFITS. 14

A. Section 10(f) relates charges to benefits actually received by a licensee. 14
B. There is no valid policy basis for the Commission's action. 17
C. The principle enunciated by the Commission is inconsistent with river basin development. 21

Point II
THE COMMISSION'S PECULIAR APPLICATION OF ITS VALUE FORMULA TO DETERMINE THE RESPECTIVE RESPONSIBILITIES OF ALABAMA AND THE UNITED STATES FOR THE COSTS OF ALLATOONA'S JOINT USE FACILITIES REQUIRES THE CUSTOMERS OF ALABAMA TO SUBSIDIZE THOSE OF THE UNITED STATES. 25

Point III
THE DECISION OF THE FEDERAL POWER COMMISSION ON THE FOREGOING ISSUES SHOULD BE SET ASIDE AS AN ABUSE OF DISCRETION AND OUTSIDE OF THE AGENCY'S STATUTORY AUTHORITY. 31

CONCLUSION 33

CITATIONS

Page

Cases:

Alabama Power Company, 13 FPC 1317 (1954); 16 FPC 827 (1956); 22 FPC 749 (1959); 27 FPC 398 (1962); 36 FPC 701 (1966). 8

Alabama Power Company, 18 FPC 257 (1957) 18, 19

Columbia River Basin, Headwater Benefits Investigation, 11 FPC 832 (1952). 24

29 FPC 238 (1963) 24

31 FPC 1044 (1964). 11, 12, 24

33 FPC 300, 907 (1965). 24

35 FPC 212, 223, 1030 (1966). 14, 24

Florida Power Corp. v. FPC, ___ F.2d ___ (C.A. 5, No. 27404, May 1, 1970). 21

The Montana Power Co., Docket No. E-6467, 11 FPC 1509 (1952). 22

National Labor Relations Board v. Brown, 380 U.S. 278 (1965) 32

New England Power Co., ___ FPC ___ (Opinion No. 576, issued April 28, 1970) 24

Peters v. Hobby, 349 U.S. 331 (1955) 32

South Carolina Electric & Gas Co., 30 FPC 1338, 1346, 1658. 10

* South Carolina Electric & Gas Co. v. Federal Power Commission, 338 F.2d 898 (CA 4, 1964), affirming the FPC's decision, 29 FPC 624 (1963). 14, 15, 16, 20, 26, 28, 29

Southeastern Power Administration, Allatoona Project, Docket No. E-6157, 16 FPC 1404 (1956). 22

Stark v. Wickard, 321 U.S. 288 (1944). 32

United States v. Carolina F. Carriers Corp., 315 U.S. 475 (1942) 32

Virginia Electric & Power Co., 37 FPC 340 (1967) 16, 28, 29

Statutes:

Act of June 10, 1920, 41 Stat. 1063. 14

Act of August 18, 1941, 55 Stat. 638 6

Act of March 2, 1945, 59 Stat. 10 6

Act of June 28, 1954, 68 Stat. 302 . . . . 6, 18

* Federal Power Act

Section 10(a), 16 U.S.C. 803(a) 6

Section 10(f), 16 U.S.C. 803(f) 3, 4, 9, 10, 11, 12, 14, 15, 16, 17, 20, 23, 25, 30, 31, 32

Page

Administrative Procedure Act, 5 U.S.C. 706 31

Congressional Documents:
H. Doc. No. 308, 69th Cong., 1st Sess. 17
H. Doc. No. 66, 74th Cong., 1st Sess. 17
H. Doc. No. 414, 77th Cong., 1st Sess. 18

Miscellaneous:
Planning Status Report: Alabama-Coosa River Basin, Federal Power Commission (1964) 6, 9, 11, 18, 22, 23

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On Petition for Review of Order
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BRIEF FOR PETITIONER,
ALABAMA POWER COMPANY

STATEMENT OF THE ISSUES

The issues presented for review by the petitioner, Alabama Power Company (hereinafter, "Alabama") are:

1. The Federal Power Act requires the Federal Power Commission (hereinafter, "Commission") to assess "equitable" charges for "interest, maintenance and depreciation" on upstream storage facilities against a licensee of downstream hydroelectric projects when the licensee is "directly benefited" by regulation of streamflows by such upstream facilities. Alabama is a licensee subject to such charges. May the Commission base such charges to Alabama upon a calculation of hypothetical benefits, some of which it concedes were not received by Alabama.

2. In previous headwater benefit cases, to determine energy gains at downstream projects resulting from regulation of streamflows by upstream storage facilities, the Commission has used actual energy production at the downstream projects and subtracted from it energy production calculated on the hypothesis that the upstream storage had not been developed. Alabama has no dispute with this procedure. May the Commission now, instead, in computing energy gains, ignore actual energy production and, for certain purposes ignore the existence of one of Alabama's projects completely, when to do so admittedly increases over actual values the computed amount of energy gains to Alabama and inflates the annual charges which Alabama must pay.

3. The Commission purports to apportion the cost of interest, maintenance and depreciation on the upstream facilities, which benefit power production both at the site of the upstream facilities and at downstream plants, in the ratio of the value of the power benefits to the owners of downstream projects to the value of the power benefits to the owners of the at site and downstream projects from construction and operation of the upstream facilities. Does this formula result in equitable charges to be borne by Alabama's customers when, in applying it, the Commission takes in account the value to Alabama of all additional power at Alabama's

downstream plants and only a fraction of the value to the United States of the federal power at site?

A motion for stay of the Federal Power Commission Order on which review is sought was denied by this Court on April 10, 1970. Other than in connection with such motion, the pending case has not previously been before this Court under the same or any similar title.

STATUTE INVOLVED

Section 10(f), Federal Power Act, 16 U.S.C. 803(f), states in relevant part:

> That whenever any licensee hereunder is directly benefited by the construction work of another licensee, a permittee, or of the United States of a storage reservoir or other headwater improvement, the Commission shall require as a condition of the license that the licensee so benefited shall reimburse the owner of such reservoir or other improvements for such part of the annual charges for interest, maintenance, and depreciation thereon as the Commission may deem equitable. The proportion of such charges to be paid by any licensee shall be determined by the Commission. The licensees or permittees affected shall pay to the United States the cost of making such determination as fixed by the Commission.
>
> Whenever such reservoir or other improvement is constructed by the United States the Commission shall assess similar charges against any licensee directly benefited thereby, and any amount so assessed shall be paid into the Treasury of the United States, . . .

*   *   *   *

REFERENCES TO RULINGS

The order presented for review was issued by the Federal Power Commission on December 17, 1969, together with Opinion No. 569, in its Docket No. E-6893. On February 11, 1970, the

Commission issued an Opinion and Order Denying Applications for Rehearing in the same docket. The Hearing Examiner's Initial Decision, which was adopted by the Commission Opinion on the issues presented for review, was dated March 25, 1969. None of the foregoing is yet reported, but all will be set forth in the Joint Appendix.

STATEMENT OF THE CASE

Section 10(f) of the Federal Power Act, set forth above, takes effect whenever the owner of a hydroelectric project licensed by the Commission is benefited by an increase in power because of the operation by another party upstream of a dam and reservoir to store water during high flow periods and release it at a time when it can be used beneficially for power purposes. In such circumstances the section requires the Commission to assess a charge against the downstream licensee as reimbursement to the owner of the upstream storage facilities for an equitable portion of the annual charges for interest, maintenance and depreciation on the upstream facilities which confer the benefit.

In this case, which concerns the years 1961-1963, Alabama is the licensee of four hydroelectric projects on the Coosa River in the State of Alabama: the Weiss, Lay, Mitchell and Jordan projects, which were benefited during the period by releases of water from storage at the upstream Allatoona development, which is owned by the United States. It is the amount of such benefits to Alabama and the resulting

equitable charge which are in dispute. The Commission, in the order under review, assessed Alabama $287,867 for the period in question. Alabama's evidence showed that its assessment should be $245,930 if it is correct on the first point covered in the Argument, post, $185,002 if it is correct on the second point only, and $150,965 if it is correct on both points.1/ Alabama, upon receipt of an interim bill from the Commission, in 1965, paid $235,261 under protest pending completion of this proceeding and recently has paid the balance stated in the order, plus $30,000 for the cost of the Commission's investigation. Because headwater benefit payments are calculated on an annual basis and Alabama has sponsored substantial additional development of the Coosa since 1963, the precedents to be established by this case will have an impact very much larger than the actual dollars here in dispute for the years 1961-1963.

Background

The development of a river basin is usually a continuing thing, and the Coosa River Basin is no exception. Copies

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1/ The figures may be found at no single source since they take into account issues decided against the Company but not raised herein. They may be derived as follows: The amount of energy in kilowatt hours which a company witness calculated was actually provided by Allatoona for each year is at Hearing, p. 222. The monetary values which the Commission determined should be placed on energy so provided is at Opinion No. 569, p. 15. The charges noted are derived by applying the formulae illustrated at the top of Hearing, pp. 279 and 280, after substituting in both the numerator (Vn) and denominator (Vd) the values for the energy actually provided.

of the Federal Power Commission's <u>Planning Status Report: Alabama-Coosa River Basin</u> (1964) will be forwarded to the Court along with this brief. It discusses past, present and future developments mentioned under this heading and contains maps showing the relationships among projects within the basin.

Of the developments with which this case is immediately concerned, the Lay, Mitchell and Jordan projects began operation between 1914 and 1929. They are run-of-the-river hydroelectric plants which utilize water to make power essentially when it reaches each project, since the projects have no seasonal storage capability.

By Act of August 18, 1941, 55 Stat. 638, Congress authorized the federal Allatoona development on the Etowah River, which together with the Oostanaula River, forms the Coosa River below Rome, Georgia. Allatoona is a hydroelectric project and has substantial seasonal storage capability which, since it started operations in 1950, has resulted in energy gains at Alabama's aforementioned three projects downstream.

Meanwhile, by Act of March 2, 1945, 59 Stat. 10, Congress reserved the remaining sites on the Coosa exclusively for federal development. Later, by Act of June 28, 1954, 68 Stat. 302, in apparent recognition of the standard of comprehensive development for all public purposes required for license by section 10(a) of the Federal Power Act, 16 U.S.C. 803(a), Congress suspended the 1945 Act to permit non-federal development of the Coosa ". . . in accordance with the

conditions of a license, if issued pursuant to the Federal Power Act . . ." Thereafter, in 1957, the Commission issued a license to Alabama for the construction of several additional hydroelectric developments on the Coosa, including the Weiss Project which is involved in this case. Weiss, which began operations in 1961, has storage capability, the operation of which -- after meeting the requirements for flood control -- has been closely coordinated for power purposes with Alabama's three older projects downstream. Starting in 1961, the operation of the Weiss storage began supplying to the three downstream projects certain of the benefits which had previously been supplied by the federal Allatoona project, the operation of which is not coordinated with Alabama's plants.

Since 1963, there have been further water resources developments in the Alabama-Coosa River basin which will affect Alabama's operations and payments for headwater benefits. Alabama has raised the power pool elevation of the Jordan and Lay projects, seven feet and fourteen feet, respectively. It has constructed the H. Neely Henry, Logan Martin and Walter Bouldin hydroelectric projects. The United States has under construction the Carters development with seasonal storage in the headwaters of the Coosa near Rome, Georgia, and has recently completed the Miller's Ferry project with power facilities downstream of the Coosa on the Alabama River. Additional developments for navigation, power and other public purposes are in the planning stage.

Headwater Benefit Determinations

As noted, upon commencement of operation of the federal Allatoona project in 1950, Alabama began to be able to generate additional energy at its three downstream projects. In 1951, the Commission initiated proceedings to determine the charges Alabama should pay the United States for such power benefits and by orders set forth at 13 FPC 1317 (1954), 16 FPC 827 (1956), 22 FPC 749 (1959) and 27 FPC 398 (1962) assessed such charges for the years 1950 through 1960. Alabama paid such assessments without dispute, in a total amount of $503,923 for the eleven year period, including charges for the cost of the Commission's determinations.

In 1961, Alabama's Weiss project, which is also benefited by the federal Allatoona project, began operation. An initial Commission determination, without hearing, assessed Alabama $296,003 for the years 1961-1963 for benefits at its four downstream projects. 36 FPC 701 (1966). Alabama applied for a hearing which has resulted in the order under review and which assesses Alabama $287,867 for energy benefits in the three-year period. No capacity benefits to Alabama have ever been determined by the Commission to result from Allatoona storage.

Two issues concerning the assessment are raised by Alabama. The first (which encompasses both 1. and 2. in the Statement of Issues) concerns the application by the Commission for the first time in river basin headwater benefit cases of

the principle: first-in-time, first in right to provide storage benefits. The Commission held that, since the federal Allatoona storage project was built prior to Alabama's Weiss storage project, storage benefits provided Alabama by Weiss which could have been provided by Allatoona should be attributed to Allatoona.

The Commission's Planning Status Report: Alabama-Coosa River Basin, states, at 4:

> The Weiss dam and reservoir, with the other licensed projects of the Alabama Power Company on the Coosa River, are operated as an integral system . . .

It is direct benefits to Alabama's integral Coosa River system from Allatoona storage which Alabama believes is contemplated to be the basis of annual charges under section 10(f) of the Federal Power Act. Alabama believes the energy actually produced by Alabama's four downstream plants during 1961-1963, less the smaller amount of energy they could have produced if Allatoona storage had not been available, represents the actual power benefits to Alabama.

The Commission rejects Alabama's position because it "would permit a project constructed downstream and later in time to discount, cancel out or allocate to itself the benefits originally provided by upstream headwater improvements". Opinion No. 569, at 9. The Commission based its assessment therefore on completely hypothetical calculations that adjusted daily flows to eliminate the actual effect of stream regulation by Weiss, and ignored Alabama's actual integral system

operation and the actual energy which it produced. While encouraging coordinated operation of hydroelectric projects in other cases as part of comprehensive development,1/ the Commission in this case substituted for an actual coordinated operation a simulated, completely fictitious operation in order to preserve what it states is the right of the United States to continue to receive payments from Alabama for those releases from storage which since 1961 Alabama has been unable fully to utilize and has had to spill over its downstream dams. If Alabama is correct in its contention that section 10(f) does not permit assessment for releases by which the licensee is not "directly benefited", as noted above, the assessment for actual benefits received by Alabama in 1961-1963 would be $245,930.2/

The simulated, fictitious operation will become more complex and depart further from actuality for years subsequent to 1963 when Alabama's additional downstream projects, which

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1/ The following condition is imposed in nearly all licenses issued by the Commission:

> Article. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

See Article 14 of Form L-3, 30 FPC 1658 (1963), issued in connection with Opinion No. 411, 30 FPC 1338, 1339, and accompanying Order issuing license, South Carolina Electric & Gas Co., 30 FPC 1346.

2/ See footnote 1, page 5

"will be operated in coordination with [Alabama's] existing system", Planning Status Report, p. 4, will also receive actual benefits from Allatoona releases.

The second issue concerns the allocation between the power customers of the United States and those of Alabama of the annual cost of interest, maintenance and depreciation (hereinafter: "section 10(f) costs") on the dam and reservoir of the federal Allatoona project which have value to power both at site and downstream and are allocated to power (hereinafter: "joint use facilities"). The section 10(f) costs were stipulated by the parties at a total of $1,762,732 for the three-year period. Hearing, p. 276-277.

As noted by the Commission in Columbia River Basin, Headwater Benefit Investigation, 31 FPC 1044, 1046-7, (1964) the joint use facilities at a headwater improvement provide two power functions. The first is a storage function which benefits at-site power and may benefit each power plant downstream. The second is a "head" function: the dam sustains a difference in elevation between the surface of its reservoir and the steam below it ("head") and the downward force of the weight of the water between the two elevations turns the turbines which turn the generators which produce power, both capacity and energy. Without the head provided by the joint use facilities, there could be no power at the site of the headwater improvement. The head function is of benefit only at-site, and downstream projects benefit solely

from the release of water from storage which they can utilize through their turbines and generators under the head already created by their own dams.

Under some headwater benefit formulas utilized by the Commission, such as that in the Columbia River case, above, the section 10(f) costs are first allocated between the head and storage function and only those allocated to storage are further allocated between power at site and downstream on the basis of power gains from water released from storage. Under the formula utilized in this case no allocation of section 10(f) costs is made between the head and storage functions. Instead, all of the section 10(f) costs are allocated according to the value to the owners of the projects at site and downstream of the power which they are able to produce with their dams, turbines and generators as a result of the joint use facilities having been constructed and placed in operation.

In the absence of an allocation between head and storage, which has the effect of insuring that the 10(f) costs to be shared by the licensee are only the costs of the storage function which has value both at site and downstream, it is absolutely essential that the total benefits derived at-site be used in the formula.

In its application of the formula the Commission uses the value of all energy which it computed to be produced by the dams, turbines and generators of Alabama's downstream

projects from storage water releases by the Allatoona joint use facilities. The Commission found that Alabama received no capacity benefits from such releases. On the other hand, the Commission does not include in its application of the formula the value of all power, capacity and energy, which the joint use facilities make possible at Allatoona.

The Commission equates value of power at a federal project with its cost, since it is sold at cost. The value, then, should be all costs allocated to power at the project, or $3,426,436 for the years 1961-1963 at Allatoona. Transcript, p. 276-278. This figure includes the specific power facilities. The Commission however holds that the value for federal power to be used in the formula, vis a vis the value of all power benefits downstream, is only the value of the joint use facilities, exclusive of the specific power facilities, or $1,968,611 for the years 1961-1963 at Allatoona. Transcript, p. 276-277. If the value of all power produced by Alabama's dams, turbines and generators is to be used in the formula, Alabama believes that the value of all power produced by Allatoona's dam, turbine and generators should also be included in the formula.

If Alabama is correct on this issue, the assessment for headwater benefits to Alabama from Allatoona for the years 1961-1963 should be $185,002; if it is correct on both issues, the assessment should be $150,965.1/

1/ See footnote 1, page 5.

ARGUMENT

I

THE COMMISSION VIOLATED THE MANDATE OF SECTION 10(f) OF THE FEDERAL POWER ACT, WHICH REQUIRES CHARGES TO BE ASSESSED AGAINST A LICENSEE "DIRECTLY BENEFITED," BY ASSESSING CHARGES AGAINST ALABAMA FOR ADMITTEDLY FICTITIOUS BENEFITS.

A. Section 10(f) relates charges to benefits actually received by a licensee.

Section 10(f) of the Federal Power Act, 16 U.S.C. 803(f), enacted in pertinent part in 1920, P.L. 280 - 66th Cong., 41 Stat. 1063, gives recognition to the fact that a "headwater improvement can increase energy production of a lower stream project by accumulating a storage at high-water times and making it available during reduced river flow." South Carolina Electric & Gas Co. v. Federal Power Commission, 338 F.2d 898, 901 (CA 4, 1964). The section requires, as a condition of receiving a license from the Commission for a hydroelectric project, that a prospective licensee agree that, if it is "directly benefited" in this fashion by a headwater improvement of another licensee, a permittee or the United States, it will reimburse the owner for an equitable part of the annual charges for interest, maintenance and depreciation on the headwater improvement providing the benefits, to be determined by the Commission. It should be noted that the section applies with equal force whether the owner of the headwater improvement is the United States or another power company. See, Columbia River Basin, Headwater Benefits Investigation, 35 FPC 1030 (1966).

In order to be "directly benefited" within the meaning of section 10(f), it is Alabama's position that a licensee must receive something of value. This value, the Court of Appeals for the Fourth Circuit held, may be evolved from the savings to a licensee of alternate energy costs. South Carolina Electric & Gas Co., 338 F.2d, at 905. The Commission disagrees; it holds in this case that a licensee must continue to make a headwater benefit payment annually to the United States on the basis of water releases from a federal project's storage that do not produce any energy gains for the licensee and that do not result in any savings to the licensee of alternate energy costs. Opinion No. 569, at 8, 9. To hold otherwise, the Commission asserts, would permit a project constructed downstream and later in time to discount, cancel out or allocate to itself benefits originally provided by upstream headwater improvements. Ibid.[1/]

This is the first time of which petitioner is aware that the Commission has permitted departure from actual benefits. It even departed from its earlier precedents and permitted the actual generation at all of Alabama's projects to be ignored.

1/ The construction by Alabama of the Weiss project, which provides some storage benefits to Alabama's Lay, Mitchell and Jordan projects that previously had been provided by the federal Allatoona project, actually results in Alabama receiving more real energy gains from Allatoona than it did when it only had three projects downstream. For periods subsequent to 1963, real gains to Alabama from Allatoona will be increased further because of additional Alabama projects downstream.

See South Carolina Electric & Gas Co., 338 F.2d, at 904; Virginia Electric & Power Company, 37 FPC 340,346 (1967). As stated by the Examiner in his Initial Decision in the South Carolina case, 29 FPC 631, 635 (1963), affirmed by the Commission, 29 FPC 624, and the Fourth Circuit, South Carolina Electric & Gas Co., supra:

> The actual energy generated by a plant downstream from an upstream storage project is a matter of record. The problem is to estimate the amount of energy the downstream plant would have produced if the upstream storage project had not been constructed. After that estimate is made, the amount thus estimated is subtracted from the actual energy generated to obtain the estimated gain in energy attributable to the upstream storage project. [Emphasis added.]

The Commission in the Virginia Electric case, supra, at 346, again confirmed the use of actual generation as the principle to be employed. In computing generation at the Weiss project, with and without Allatoona storage, the Commission staff, however, intentionally disregarded the actual generation at Weiss from Weiss' own flood control storage. In computing the generation at Lay, Mitchell and Jordan with and without Allatoona storage, it intentionally disregarded the actuality that Weiss was regulating the river. On such bases, it determined energy gains to Alabama of 188,252,693 kwh, approximately 20% more than the 154,493,773 kwh determined by Alabama in accordance with the approved methodology of subtracting computed generation without Allatoona from actual generation.

Section 10(f), however, speaks in terms of a "licensee. . . directly benefited". If a licensee is not directly benefited, section 10(f) does not come into play. The section did not

require Alabama, when it accepted its licenses, to agree to pay for headwater benefits it did not receive. The Commission by assessing charges on the basis of benefits Alabama did not receive exceeds its authority under the section.

B. <u>There is no valid policy basis for the Commission's action.</u>

The Commission's decision to assess Alabama for benefits it did not actually receive was based upon the fact that Allatoona was built before Weiss and could have provided the benefits to Alabama, if Alabama had not built Weiss. Opinion No. 569, at 8, 9. The decision prevents Alabama from benefiting from storage releases from its own project.

Section 10(f) by its terms requires the occurrence of a direct benefit before the Commission may assess charges against downstream project owners. It does not by its terms provide an upstream developer, whether private or federal, any assurance of a perpetual assessment against downstream project owners in return for its construction of a headwater storage improvement. The Commission's assertion of a first-in-time doctrine in this respect has no support in the Act, and its error can be demonstrated further by the following considerations.

1. The legislative history shows that Congress expected Allatoona, authorized in 1941, to be just an early step in the comprehensive development of the Alabama-Coosa River System. H. Doc. No. 308, 69th Cong., 1st Sess.; H. Doc. No. 66, 74th Cong., 1st Sess.; Resolutions of the House Committee on

Rivers and Harbors, April 1 and 28, 1936, and Senate Committee on Commerce, January 18, 1939; H. Doc. No. 414, 77th Cong., 1st Sess. See also Planning Status Report: Alabama-Coosa River Basin (Federal Power Commission, 1964).

In the licensing of Weiss to Alabama, the Commission had knowledge that Weiss would provide downstream headwater benefits and placed no limitation on them. Section 6 of the Act of June 28, 1954, 68 Stat. 302, allowing for private development along the Coosa River required that before "a license is issued, the applicant for the license shall submit a report on the details of its plan of development to the Federal Power Commission." Alabama's plan for Weiss is of public record at the Commission (Project No. 2146), and it is clear from the plan that by water storage and release, downstream headwater benefits would result. Weiss' license, issued by the FPC in 1957, places no restriction on headwater benefits. 18 FPC 257-273 (1957). The license order notes that generally Weiss would provide benefits to other river projects: "for the upper reach of the Coosa River between Gadsden and Rome, the Applicant's Weiss development would provide stream flow regulation to support about 40,000 kilowatts of capacity at proposed downstream plants. . . ." (at 261) The Commission's license order makes no reference to Allatoona.

The license order, in addition to Weiss, covers the other developments on the Coosa that Alabama has since installed and discusses in detail the comprehensive development of the

stretch of river involved. It notes that Alabama's investment will provide flood control storage benefits having an annual value of $424,000 and that Alabama will make provision in the project plans for new, future navigation locks and will provide recreational benefits. (at 268) Alabama receives no reinbursement for these public benefits. The license was made subject to standard terms and conditions which provide continuing Commission control over certain aspects of the project, as well as special terms and conditions which further extend that control. (at 270-273) For the Commission in 1957 to authorize the comprehensive development of the stretch of river by Alabama (after considering over 80 different series of dams (at 261)) at an estimated cost then of $120,961,100 and in 1970 to say that Alabama must pay the United States for benefits which Alabama supplies itself through the same comprehensive development finds no support in law or policy.

2. Alabama operates its Weiss storage intentionally to maximize power benefits at site and at its downstream plants. These plants of the licensee are coordinated as an integral power system. Allatoona is not a part of such system. There is no coordination contract covering releases from Allatoona. The Commission does not and cannot find that scheduled releases were made by Allatoona to maximize or even provide power benefits to Alabama--such releases are made in

the sole discretion of the United States. Transcript, pp. 281, 518. To hold that the benefits of Alabama's integral operation may be taken away from Alabama because the owner of upstream storage unilaterally decides to release some water has no basis in law or policy.

3. The Commission's decision lost sight of the fact that section 10(f) is concerned with the relationship between upstream and downstream owners of projects and does not differentiate between upstream storage projects owned by the United States and those owned by private companies. If the approach taken by the Commission in this case were applied to a private company which provided headwater storage releases, the inequity would seem obvious. It would seem clear that the rights to headwater benefits payments of private licensees are not protected against subsequent licenses. In the event a licensee built an upstream storage reservoir which provided its own headwater benefits, no principle of law or equity would require it to continue to pay the other licensee for benefits it no longer received. To do so would be for one company to subsidize the other. As pointed out in South Carolina Electric & Gas Co., 338 F.2d at 904, the downstream licensee "is a debtor and an obligor" to the upstream owner for its share of the headwater benefits charges. Obviously such debt and obligation must be based upon benefits actually conferred. The Commission has no authority to require Alabama to subsidize

Allatoona. Cf. Florida Power Corp. v. F.P.C. (C.A. 5, No. 27404, May 1, 1970).

4. Discriminatory taxation results from the Commission's holding. To disregard Weiss' intentional, coordinated effect on Alabama's downstream operations is not only to deny Alabama the right to reap the benefits of its own investment, but also to charge it for something the Government did not provide. The Commission's intentional overstating of the benefits to Alabama from Allatoona amounts to discriminatory taxation of Alabama's customers who ultimately must pay for headwater benefits charges through their electric bills.

C. The principle enunciated by the Commission is inconsistent with river basin development.

The Commission's Order adopts the principle that the owner of the first storage project on a stream has a right to continue to receive payment for all its storage releases even after a later project is making releases that render the first's valueless. This implies a role for water resource developments which becomes fixed at the time of their construction.

Changes in functional operations of hydro-storage projects are, however, a normal occurrence in river basin operations. In the Alabama-Coosa River System, as with other river basins throughout the country, as additional projects are added and conditions change, the requirements for flood control, irrigation, low-flow augmentation, recreation and power at particular projects will change. When such changes occur, the

capital costs of the project may even be reallocated to reflect the changed use so that no use shall continue to bear annual charges out of proportion to the current benefits from such use.

For example, at Allatoona changes in allocation of project costs to the functions of the project have occurred. Public records of Docket No. E-6157 at the Federal Power Commission show, by letters dated August 31, 1954, and October 31, 1956, and by Order of December 31, 1956, 16 FPC 1404, that there has been a decrease in project costs allocated to flood control and an increase in the rate for the sale of electric power from Allatoona. A dramatic example of changes in allocation of project costs in connection with the Canyon Ferry Development is recorded in the public files of Federal Power Commission, Docket No. E-6467. Between 1965 and 1966 there was an increase in the capital costs of joint use facilities allocated to flood control from $472,489 to $5,017,973, a decrease for irrigation from $7,795,762 to $4,561,025, and a decrease for power from $13,744,217 to $12,264,355. An increase in flood control storage ordinarily results in less storage available for power at site and downstream. Headwater benefits certainly cannot be conceptualized as something fixed and absolute, any more than other project benefits.

As shown in the Planning Status Report: Alabama-Coosa River Basin, additional projects since Weiss have been authorized for development in the Alabama-Coosa River Basin.

When completed, no doubt, these additional projects will alter the relationships among the existing hydroprojects. Millers Ferry, a federal project, will be located downstream from Allatoona and Weiss on the Alabama River and in all likelihood will reap headwater benefits from both. Planning Status Report, pp. 6-17. Though the Government cannot be charged for the benefits received from Weiss, Millers Ferry will affect the charges Alabama must pay to the United States for regulation at Allatoona because the section 10(f) costs at Allatoona will be allocated to an additional downstream recipient. Furthermore, Carters, a federal project, will be located upstream from Alabama's four projects and, together with Allatoona, will provide headwater benefits to those projects. Since the 3-year period involved in this proceeding, Alabama has placed in operation in the basin the H. Neely Henry, the Logan Martin and the Walter Bouldin projects and has raised the height of Lay by 14 feet and of Jordan by 7 feet. These additional federal and private developments will be involved in determining headwater benefits charges in the future. It is against this background of continuing river basin development that the Commission's assertion of a "first-in-time, first-in-right to provide storage benefits" rule must be examined.

The Commission's application of section 10(f) to the extensive hydroelectric operations (federal and non-federal)

along the Columbia River and its tributaries provides another example of flexibility in development and flexibility in determination of headwater benefit charges on the basis of direct benefits actually conferred at any given time. The Staff reports in each instance protested a licensee's right to utilize its own storage to the fullest extent possible. The Commission's orders are set out at 11 FPC 832 (1952); 29 FPC 238 (1963); 31 FPC 1044 (1964); 33 FPC 300,907 (1965); 35 FPC 212, 213, 1030 (1966).

In a somewhat different context, but equally applicable here, Chairman Nassikas noted in a recent decision: "the Staff [proposed] condition would in effect require the New England Power Company to perpetuate for certain planning and operating purposes a hypothetical system -- one which once existed but does no longer. * * * * We think that result would be quite unreasonable." New England Power Co. (FPC Opinion No. 576, issued April 28, 1970).

II

THE COMMISSION'S PECULIAR APPLICATION OF ITS VALUE FORMULA TO DETERMINE THE RESPECTIVE RESPONSIBILITIES OF ALABAMA AND THE UNITED STATES FOR THE COSTS OF ALLATOONA'S JOINT USE FACILITIES REQUIRES THE CUSTOMERS OF ALABAMA TO SUBSIDIZE THOSE OF THE UNITED STATES.

To allocate equitably the section 10(f) costs of joint use facilities among those benefited by them, the Commission has developed a series of formulae. The particular formula which the Commission uses in this case is known as the "value" formula since the value of power benefits to each party is used to make the apportionment. Other formulas use units of power in a similar fashion. Alabama does not in this case contest the use of the "value" formula or its theoretical soundness.

Under the value formula, a licensee directly benefited by joint use facilities owned by another is assessed a portion of the section 10(f) costs determined by multiplying such costs by a fraction consisting of the value of all power benefits received by the licensee as the numerator and the value of all power benefits received by all parties, including the owner of the joint use facilities, as the denominator.

As noted in the Statement of the Case, at 11, to which reference is here made, joint use facilities at a headwater improvement serve two power functions: a "head" and a "storage" function. The storage function has value since it makes available water which can be utilized by the turbines and generators of the owner of the headwater improvement, as well

as the turbines and generators of owners of downstream plants, to produce power. The head function, however, benefits only the owner of the joint use facilities. Its value to such owner lies in the fact that, because of it, power can be generated at the project; without it no power can be generated. The value formula does not allocate the costs of the joint use facilities between the head and storage function which makes extremely important the inclusion of the value of all power benefits at site if the owner of downstream projects which benefit from only the storage function are to be equitably assessed.

Once the power benefits to downstream licensees are determined, expressed in units of power, a value is assigned based on the cost of obtaining equivalent power from the most likely alternative source. When the joint use facilities of the headwater improvement are owned by the United States, however, the value of power benefits at site is determined by a different method. Since power from a federal project is sold to recover its costs, the value of power at a federal project is equated to its cost, even though that is lower than the cost of equivalent power from an alternative source. This formulation of the value of power at a federal project was accepted by the Fourth Circuit in the South Carolina case, 338 F.2d, at 905. The Court stated

> . . . The value of service to Clark Hill [the federal project] is the sale price there of the energy and this by law must closely approach the cost of production at Clark Hill. Flood Control Act of 1944, supra, 58 Stat. 887, 890.

After determining the value of all power gains to Alabama for use as the numerator of the formula and as a part of the denominator, the only factor for determination by the Commission was the value of power benefits at the federal Allatoona project, since the section 10(f) costs had been stipulated. The Commission did not, however, determine this at-site value by using the cost of the power at Allatoona made possible by the head and storage functions of the joint use facilities. This figure would have been the total costs allocated to power at Allatoona or $3,426,436. Transcript, at 276-278. The Commission used instead the figure of $1,968,611, Transcript, at 276-277, the costs of the joint use facilities only, ignoring the costs of the turbines and generators at the project. The value of power at Allatoona made possible by the joint use facilities, then, is not only understated compared to the cost of equivalent power from the most likely alternative source, it is also understated compared to the amount of its own cost.

The alleged rationale behind excluding the costs of specific power facilities at federal headwater improvements from the value of power for use in the formula is stated in the Staff Report, Exhibit 1, p. 16, as follows:

> The annual value to the United States of the at-site power produced at the Allatoona project is considered to be equal to the total annual power costs. The components making up the total annual power costs are the annual costs of specific power facilities and the annual costs of the joint-use facilities to be borne by power. Specific power facilities are of value to the at-site plant

> only, whereas joint use facilities provide benefits both at site and downstream. Hence, the total annual costs consisting of the annual fixed charges and the operation and maintenance costs on the joint-use facilities allocated to power represent the value of the headwater improvement to at-site power to be used in the formula for apportioning the charges of interest, depreciation and maintenance on the joint-use facilities. (Emphasis supplied)

"Hence", since "the specific power facilities are of value to the at-site plant only", the Commission concludes that their cost should not be included in the value of power at-site to apportion the cost of joint use facilities on the basis of the value of power received by the joint users. Logic simply does not exist in the foregoing reasoning; total at-site value (cost) of power must be included in the formula to achieve equity, and it is the customers of Alabama and other licensees subjected to the formula who suffer from its absence.

While Alabama believes it is the first licensee to accept the value formula while challenging its application, Alabama is not the first licensee to challenge the inequities which result from its application. While there has been no headwater benefits determination in which other formulae were used that have been litigated through final decision, the value formula was at issue in South Carolina Electric & Gas Co., supra, and in Virginia Electric & Power Company, 37 FPC 340 (1967). In both cases the licensees offered alternatives, which the Commission found unacceptable. In the South Carolina case, the Commission found the alternative "fundamentally defective because of its numerous unrealistic and unsupportable

assumptions, including the postulating of two hypothetical head and storage function dams, . . ." and adopted the staff application of the value formula. 29 FPC, at 630. In the Virginia Electric case, the licensee's alternative was rejected on the basis that the application of the value formula was approved in the South Carolina case, which had been affirmed on appeal. 37 FPC, at 347.

The licensee in South Carolina, however, apparently did not raise its alternative before the Fourth Circuit or question the aspect of the application of the formula now raised by Alabama, for no mention is made in the decision on these questions. See, 338 F.2d 898. The licensee in that case apparently did urge that the value of federal power be determined by the cost of equivalent power from the most likely alternative source, Id., at 905, or that the licensee's incremental costs be used to determine the value of the power to it, which would get at the same problem, the understating of the value of federal power in the application of the formula. As noted, the Court held that value of power may equal cost of power at a federal project and, further, that "the search is for a value to a recipient after production rather than the cost of production." Id., at 905. In any event, the issue raised here and not covered in the Fourth Circuit's opinion, is what federal power costs should be included in the value formula, the reasonableness of equating power costs to power values at a federal project being accepted.

It is Alabama's position that since its cost of equivalent power from an alternative source is included in the formula as the value of the power to it, the power costs of the federal Allatoona project, including the costs of the specific power facilities, must be included in the value of federal power, if the value formula is to work equity in apportioning the costs of facilities which benefit both Alabama and the United States. The Commission rejected Alabama's position without discussion "in light of consistent Commission practice . . ." Opinion No. 569, at 5.

Alabama does not claim that the Commission assessment as a result of its application of the formula is more than the value to it of energy equivalent in amount to that which it is able to produce at its downstream hydroelectric projects as a result of storage releases at Allatoona. It urges, however, that the standard of equity in section 10(f) requires that its customers share the section 10(f) costs substantially equally with the customers of the United States. Alabama's customers through their power bills are already paying the costs of comprehensive development at Alabama's projects, costs associated with such public purposes as flood control and recreation which are not included in the power bills of customers of multipurpose federal projects. Alabama urges that its customers cannot in equity be further burdened in relation to federal customers.

III

THE DECISION OF THE FEDERAL POWER COMMISSION ON THE FOREGOING ISSUES SHOULD BE SET ASIDE AS AN ABUSE OF DISCRETION AND OUTSIDE OF THE AGENCY'S STATUTORY AUTHORITY.

The Administrative Procedure Act, 7 U.S.C. 706, requires that a reviewing court "hold unlawful and set aside agency action, findings, and conclusions found to be * * * an abuse of discretion [or] * * * in excess of statutory jurisdiction, authority, or limitations, or short of statutory right * * *" We believe that the Commission's decision in this case fails in these respects. The FPC's determination was clearly outside of the section 10(f) congressionional standard of <u>an equitable determination for benefits directly received by a licensee</u>. Admittedly the standard is broad. Yet, here, the Commission splits Alabama's Coosa River plants into uncoordinated and separate systems, even though in fact they are under one legal ownership and operated in coordination by one licensee, and charges Alabama for headwater benefits which Allatoona did not provide. By adopting the peculiar application of its value formula the Commission further discriminates against customers of Alabama <u>vis a vis</u> those of the United States. By these actions the Commission abuses any discretion it may have within which to make its determination under the "equity" standard and acts in excess of its authority under section 10(f).

"Agencies, whether created by statute or Executive Order, must of course be free to give reasonable scope to the terms conferring their authority. But they are not free to ignore plain limitations on that authority." Peters v. Hobby, 349 U.S. 331, 345 (1955). Administrative agencies will be required to follow Congressional mandate. Stark v. Wickard, 321 U.S. 288 (1944). Where Congress has set standards for agency action, such as here, the Court must determine whether such standards were applied. As noted in United States v. Carolina F. Carriers Corp., 315 U.S. 475, 489 (1942): "Congress has also provided for judicial review as an additional assurance that its policies be executed. That review certainly entails an inquiry as to whether the Commission has employed those statutory standards." Reviewing courts are not obliged to stand aside and rubberstamp their affirmance of administrative decisions that they deem inconsistent with a statutory mandate or that frustrate the congressional policy underlying a statute, particularly where the review is not of a question of fact, but of a judgment as to the proper balance to be struck between conflicting interests. National Labor Relations Board v. Brown, 380 U.S. 278, 291-2 (1965).

Alabama believes that the Commission's actions on the issues raised herein are an abandonment of the standards set by Congress in section 10(f): "whenever any licensee hereunder is directly benefited by the construction work * * * of the

United States of a storage reservoir * * * the Commission shall require * * * that the licensee so benefited shall reimburse the owner of such reservoir * * * for such part of the annual charges * * * thereon as the Commission may deem equitable." [Emphasis added.]

CONCLUSION

For the foregoing reasons, the amount of the Federal Power Commission's assessment against Alabama for headwater benefits from Allatoona in the years 1961-1963 is excessive and should be set aside. Instead of the amount of $317,867 ($287,867 for benefits and $30,000 for the costs of the Commission's investigation), the assessment should be A., $275,930 ($245,930 plus $30,000) if Alabama is correct on Point I, only; B., $215,002 ($185,002 plus $30,000) if Alabama is correct on Point II only; and C., $180,965 ($150,965 plus $30,000) if Alabama is correct on both Points I and II.

The Commission's Order should be set aside insofar as the issues raised in Point I and Point II hereof are concerned, and Alabama ordered to pay the proper assessment.

Respectfully submitted,

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June 19, 1970

In The

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 24067

ALABAMA POWER COMPANY, PETITIONER

v.

FEDERAL POWER COMMISSION

On Petition for Review of an Order
of the Federal Power Commission

BRIEF FOR INTERVENOR, UNITED STATES,
ON BEHALF OF THE SECRETARY OF THE INTERIOR

WILLIAM D. RUCKELSHAUS,
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INDEX

Page

Statement of the issues ---------------------------------- 1

Statute involved -- 2

Proceedings before the Commission ------------------- 3

Statement of the case ------------------------------- 3

A. Background --------------------------------- 4

B. The proceedings before the Commission ----- 7

1. Elimination of Weiss in calculating benefits to Lay, Mitchell and Jordan ----- 8

2. Treatment of the portion of Weiss' reservoir allocated to flood control ----- 12

3. Value to the United States of the joint use facilities --------------------- 14

Argument:

I. The Commission properly considered and rejected the existence of Weiss in calculating the energy gains realized at Alabama's Lay, Mitchell and Jordan projects --------------------------------- 18

A. In order to promote the most economical utilization of power resources, a new hydroelectric project should only be given credit for the incremental headwater benefits which it bestows on downstream projects over and above the benefits already provided by an existing project --------- 18

Page

B. In addition to being justified by resource utilization policy, the Commission's method of determining benefits was reasonable and is not inconsistent with past Commission practice ---------------------------- 20

1. Not inconsistent with past Commission practice -------------------- 20

2. Alabama was "directly benefited"-- 21

3. The fact that changes in the functional operations of hydroelectric projects may occur, does not require a different result ------------------ 22

4. Coordination of the operations of Alabama's projects is no justification for preempting the benefits provided by Allatoona ------------------ 23

5. The same procedure would have been used had Allatoona been a non-federal project --------------------- 24

II. The Commission properly ignored the flood control capacity of Weiss in calculating the headwater benefits received by Weiss -- 25

III. The Commission properly included only the costs of the joint use facilities in the formula apportioning 10(f) costs ---------- 27

IV. The Commission did not abuse its discretion in rejecting Alabama's arguments ----- 31

Page

CITATIONS

Cases:

Alabama Power Company, 13 FPC 1317; 16 FPC 827; 22 FPC 749; 27 FPC 398 ------------------ 6

Alabama Power Company, 18 FPC 257 ------------- 7,18

Alabama Power Company, 36 FPC 701; 36 FPC 883 - 32

Permian Basin Area Rate Cases, 390 U.S. 747 (1968) -- 32

*South Carolina Electric & Gas Co. v. Federal Power Commission, 338 F.2d 898 (C.A. 4, 1964) - 21,30, 31

Virginia Electric Power Company, 37 FPC 340 (1967) -- 21

Virginia Electric Power Co. v. Federal Power Commission, 351 F.2d 408 (C.A. 4, 1965) ------ 30

Statutes:

Act of August 18, 1941, 55 Stat. 638 ---------- 5

Act of March 2, 1945, 59 Stat. 10 ------------- 6

Act of June 28, 1954, 68 Stat. 302 ------------ 6,19

Federal Power Act
*Section 10(f), 16 U.S.C. 803(f) ---------- 3,4,5, 15,16,17,21,22, 23,24,27,28,31

Section 17, 16 U.S.C. 810 ---------------- 5

Page

Statutes--Continued

Section 313(b), 16 U.S.C. 825l(b) -------- 31

Flood Control Act of 1944
Section 5, 16 U.S.C. 825s, 58 Stat. 890 -- 4

Miscellaneous:

Federal Power Commission, Planning Status Report: Alabama-Coosa River Basin (1964) ---- 6

15 Fed. Reg. 1901 ---------------------------- 5

18 C.F.R.
11.25(b)(4) ---------------------------- 4

11.27(a) ---------------------------------- 27

11.27(b) ---------------------------------- 27

---

* Indicates the authorities primarily relied on herein.

In The

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 24067

ALABAMA POWER COMPANY, PETITIONER

v.

FEDERAL POWER COMMISSION

On Petition for Review of an Order
of the Federal Power Commission

BRIEF FOR INTERVENOR, UNITED STATES,
ON BEHALF OF THE SECRETARY OF THE INTERIOR

STATEMENT OF THE ISSUES 1/

1. Whether, in a headwater benefits proceeding under Section 10(f) of the Federal Power Act, the Federal Power

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1/ A motion for stay of the Federal Power Commission Order on which review is sought was denied by this Court on April 10, 1970. Other than in connection with such motion, the pending case has not previously been before this Court under the same or any similar title.

Commission correctly limited the headwater benefits attributable to a newly developed hydroelectric project to the increase in benefits which construction of the new project brought about over and above the headwater benefits which were already being provided by an existing, federally owned hydroelectric project.

2. Whether, in applying its formula for apportioning the annual charges for interest, maintenance and depreciation of a headwater improvement among those benefitted by such improvement, the Commission applied the proper criteria for determining the value of one of the components of the formula--namely, the value of the headwater improvement to the at site production of power.

STATUTE INVOLVED

Section 10(f) of the Federal Power Act, 16 U.S.C. 803(f), states in relevant part:

> That whenever any licensee hereunder is directly benefited by the construction work of another licensee, a permittee, or of the United States of a storage reservoir or other headwater improvement, the Commission shall require as a condition of the license that the licensee so benefited shall reimburse the owner of such reservoir or other improvements for such part of the annual charges for interest, maintenance, and depreciation thereon as the Commission may deem equitable. The proportion of such charges to be paid by any licensee shall

be determined by the Commission. The licensees or permittees affected shall pay to the United States the cost of making such determination as fixed by the Commission.

Whenever such reservoir or other improvement is constructed by the United States the Commission shall assess similar charges against any licensee directly benefited thereby, and any amount so assessed shall be paid into the Treasury of the United States, to be reserved and appropriated as a part of the special fund for headwater improvements as provided in section 810 [Section 17 of the Federal Power Act] of this title.

* * * *

PROCEEDINGS BEFORE THE COMMISSION

The order of the Federal Power Commission presented for review was issued, together with Opinion No. 569, on December 17, 1969, in its Docket No. E-6893. An Opinion and Order Denying Applications for Rehearing was issued by the Commission in the same docket on February 11, 1970. The Hearing Examiner's Initial Decision was dated March 25, 1969.

STATEMENT OF THE CASE

The headwater benefit proceedings below before the Federal Power Commission were initiated under Section 10(f) of the Federal Power Act, set forth above, to determine the

benefits 2/ received by the Alabama Power Company ("Alabama") during 1961, 1962 and 1963 at its four licensed hydroelectric projects on the Coosa River in Alabama from an upstream federal project and to determine the "equitable" proportion of the "annual charges for interest, maintenance, and depreciation" (Section 10(f)) of the federal project to be borne by Alabama as a result of such benefits. Alabama seeks review in this Court of both the Commission's determination of benefits and its method of apportioning the costs of the federal project.

The Secretary of the Interior, a formal party before the Commission, see 18 C.F.R. 11.25(b)(4), was granted leave to intervene in this review proceeding by this Court on May 5, 1970. The Secretary's interest stems from his obligation, pursuant to Section 5 of the Flood Control Act of 1944, 16 U.S.C. 825s, to market and set the rates (subject to the Commission's approval) for the power produced at the federal project here involved, which project is operated

2/ Headwater benefits are created by an upstream hydroelectric storage project by impounding water in its reservoir during periods of high flow when the downstream hydroelectric project is operating at capacity and cannot beneficially use the additional water and releasing that water (over and above the natural flow of the river) during periods when it can beneficially be used downstream to generate power.

and maintained by the Army Corps of Engineers. This marketing is performed by the Southeastern Power Administration, established by and under the control and direction of the Secretary. 15 Fed. Reg. 1901. As the power rates established by the Secretary are based on the costs of producing power (including the amortization of that portion of the capital investment in a project allocable to power), such rates are affected by the proportion of the costs of the federal project to be borne by Alabama as a result of its receipt of headwater benefits. 3/

A. Background

Three of the four Alabama dams involved in this case--the Lay, Mitchell and Jordan projects--began operation on the Coosa River between 1914 and 1929. They are run-of-the-river plants--*i.e.*, they have no substantial reservoir storage capacity and thus their operation depends upon the flow of the river.

The federal Allatoona project, authorized by Congress in 1941, Act of August 18, 1941, 55 Stat. 638, 641, began

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3/ Under Section 10(f), moneys payable to the United States as a result of headwater benefits bestowed by federal projects are paid into the Treasury and applied to a special fund for headwater improvements as provided in Section 17 of the Federal Power Act, 16 U.S.C. 810. Under intragovernmental accounting procedures, a portion of such moneys are applied against the costs of producing and marketing power and thus affect the power rates established by the Secretary.

operation on the Etowah River (which joins the Oostanaula River at Rome, Georgia, to form the Coosa) in 1950. Allatoona's substantial reservoir is used both for power generation and flood control. Assessments totalling $482,031 (plus additional amounts for the costs of the Commission's determinations) for headwater benefits conferred by Allatoona upon Lay, Mitchell and Jordan for the years 1950 through 1960 were made by successive Commission orders. 13 FPC 1317; 16 FPC 827; 22 FPC 749; and 27 FPC 398.

After the Allatoona project had been authorized, Congress authorized the further federal development of the Alabama and Coosa Rivers and tributaries pursuant to a comprehensive plan for navigation, flood control and power development prepared by the Corps of Engineers. Rivers and Harbors Act of March 2, 1945, 59 Stat. 10, 17. See Federal Power Commission, Planning Status Report: Alabama-Coosa River Basin, pp. 8-9 (1964), filed in this Court with Alabama's brief.

By Act of June 28, 1954, P.L. 436, 68 Stat. 302, Congress suspended its authorization for exclusive federal development of the Coosa River and permitted non-federal development pursuant to licenses issued under the Federal

Power Act and consistent with the comprehensive plan previously developed. Pursuant to this statute, the Commission in 1957 issued a license to Alabama for the development of a series of projects on the Coosa River, collectively designated as Project No. 2146. 18 FPC 257, 265. The Weiss dam, constructed between Allatoona and Alabama's three run-of-the-river projects, was the only new unit completed and operative under the license during the years 1961 through 1963. Weiss is a storage project having a substantial reservoir capacity for flood control and the seasonal storage of water.

B. <u>The Proceedings Before the Commission</u>

Following a 1965 Commission staff report (Exhibit 1), consultations with the parties and consideration of written submissions, the Commission on September 26, 1966 issued an order directing Alabama to pay a total of $296,003 for headwater benefits received during the 1961-1963 period, plus $18,724 for the cost of making the determination. 36 FPC 701. Thereafter, Alabama's application for a hearing was granted. 36 FPC 883.

At the hearing before the examiner, extensive evidence was presented on a broad range of issues. A major portion of

the hearing and argument before the Commission, for example, was devoted to the question of whether Alabama, or the interconnected electrical system of which it is a part, had realized any capacity gains from the federal operations at Allatoona in addition to the energy gains it admittedly received. 4/ Only the evidence relating to the issues involved in this review proceeding will be discussed here.

1. Elimination of Weiss in calculating benefits to Lay, Mitchell and Jordan. Prior to the construction of Weiss, energy gains to Alabama's three run-of-the-river projects had been calculated as follows: If on days when Allatoona impounded water, the water could have been used to generate electricity at the three downstream projects (after allowing for travel time), "negative energy gains" were recorded equal to the difference between the amount of energy that

4/ "Energy gains" are measured by the cumulative increase over a given period of time of electrical energy generated at the downstream project as a result of the beneficial operation of the upstream project; "capacity gains", on the other hand, are related to the increased capacity of an electrical system of which the downstream project is a part to generate electricity during a peak period of demand. The Secretary did not seek review of the Commission's rejection of the Secretary's and the Staff's contention that Alabama and its affiliates realized capacity gains from the operation of the federal Allatoona project.

would have been produced but for Allatoona's impounding and the amount of energy actually generated at the three downstream plants. If the water so impounded could not have been used (i.e., the downstream generators were operating at capacity even with the reduced flow), no "negative energy gains" were recorded. On days when Allatoona released (over and above the natural flow of the river) water, "positive energy gains" would be recorded to the extent that such water (again allowing for travel time) could be beneficially used at the downstream plants (i.e., to the extent that such released water did not exceed the generating capacities of the downstream plants). The gains recorded on such a day would be equal to the difference between the energy actually generated and the lesser amount of energy which would have been generated under natural flow conditions. The excess of the sum of "positive energy gains" over the sum of "negative energy gains" in a particular year are the "energy gains" to Alabama attributable to Allatoona regulation for that year.

The construction of Weiss with its substantial reservoir capacity gave rise to a new problem. The Weiss dam had a substantial re-regulating effect on the regulation previously

attributable solely to Allatoona, and with this added regulation of the river by Weiss, the energy gains realized by Lay, Mitchell and Jordan were increased. Moreover, if Allatoona were not on the river, Weiss alone would have been able to provide the three lower projects with a substantial portion of the benefits which Allatoona had provided before Weiss was constructed.

In calculating the energy gains realized by Lay, Mitchell and Jordan from Allatoona (the calculations of the gains received by Weiss were made separately, see infra, pp. 12-14) during 1961, 1962 and 1963, the Staff eliminated the effect of the Weiss' re-regulation (H. 108, 113-114). 5/ Thus, the actual energy outputs of those three projects were adjusted by deducting energy produced by water releases from Weiss and adding energy which would have been produced had Weiss not impounded water (H. 114). The effect of the Staff's approach was to determine the energy gains realized at Lay,

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5/ "H." references are to the transcript of the hearing. "Exam. Dec." references are to the examiner's decision and "Dec." references are to the initial opinion of the Commission. "Ex." references are to the exhibits. All portions of the record referred to herein will be printed in the joint appendix to be prepared following the filing of this brief.

Mitchell and Jordan from Allatoona as if Weiss was not on the river; only the incremental benefits bestowed by Weiss on the three lower dams over and above the benefits which the above procedure attributed to Allatoona were credited to Weiss.

Alabama, on the other hand, presented its own study and calculations based upon an estimate of the energy that all four of its projects (including Weiss) would have produced had Allatoona not been on the river, which estimate was then subtracted from the aggregate actual metered generation of the plants. In making the estimate, of course, assumptions had to be made as to how Weiss would have been operated without the prior regulation of Allatoona (H. 223-225). The effect of Alabama's approach was to credit to Weiss both the incremental headwater benefits which its construction produced as well as a substantial portion of the benefits which would have continued to accrue to Lay, Mitchell and Jordan from Allatoona had Weiss not been built.

Both the Examiner (Exam. Dec. 7) and the Commission (Dec. 8-9) rejected Alabama's approach and adopted the Staff's method for calculating benefits to Lay, Mitchell and Jordan. The Commission noted that, in effect, Alabama's procedure "would permit a project constructed downstream and

later in time to discount, cancel out or allocate to itself the benefits originally provided by upstream headwater improvements" (Dec. 9).

2. <u>Treatment of the portion of Weiss' reservoir allocated to flood control</u>. Both Allatoona and Weiss operate under separate flood control procedures worked out with the Army Corps of Engineers. Under these procedures, varying portions of the two reservoirs (depending upon the time of year) are reserved for flood control. Plate 3 to Exhibit 1 contains a graph showing the portion of the Weiss reservoir reserved for flood control for any given day during the year. The portion of the reservoir immediately below the flood control zone is designated as the "power pool." The line on the graph separating the power pool from the flood control zone is called the "rule curve" in that when the level of the reservoir exceeds the "rule curve"--*i.e.*, invades the flood control storage zone--certain designated procedures come into play to ensure the prompt evacuation of such zone. Depending upon what rule applies, however, the rate of prescribed evacuation may not exceed the capacity of the turbines and thus temporarily stored flood waters may often be beneficially used to generate electricity.

In calculating the energy gains realized by Alabama at Weiss from Allatoona, the Staff did not credit Weiss with "negative energy gains" on days when Allatoona impounded water to the extent that such water, if not impounded, would have raised the height of Weiss' power pool above the rule curve (H. 109), notwithstanding the fact that such water might nevertheless have been used to generate electricity under the applicable flood control procedures. Consistently, however, the Staff did not assess "positive energy gains" against Weiss to the extent that releases from Allatoona raised the height of Weiss' power pool above the rule curve, even though such releases might also have been beneficially used to generate power (H. 109).

Alabama, in its submission, gave full effect to the possibility that the flood control zone of Weiss could be used under the existing regulations to store water for power purposes (H. 223-225). Alabama had made no attempt, however, to determine from the Corps of Engineers whether Weiss would be operated differently for flood control purposes if Allatoona's flood control capacity were not available (H. 941-943). Finally, Alabama was unable to state what portion of the difference in energy gains as calculated by the Staff and

as calculated by Alabama was attributable to the different treatment of the Weiss flood control capacity and what portion was attributable to the Staff's failure to consider Weiss in calculating energy gains to Lay, Mitchell and Jordan (H. 824).

The Examiner, in an analysis approved by the Commission (Dec. 9-10), set forth at some length the flood control procedures affecting both Weiss and Allatoona and noted that, despite an isolated phrase suggesting independence of operation, the procedures called for some co-ordination between the two projects (Exam. Dec. 8-11). He therefore concluded that it must be assumed that, if Allatoona were not on the river, Weiss would be operated for flood control purposes in a manner different from the existing procedures (Exam. Dec. 11). He thus rejected Alabama's contention that Weiss' flood control storage zone should be considered in calculating the energy Weiss would have produced in the absence of Allatoona.

3. Value to the United States of the joint use facilities. The parties are in agreement as to the basic formula to be used in apportioning between the United States

and Alabama the annual charges allocable to power for interest, maintenance and depreciation (hereinafter the "10(f) costs") of the Allatoona dam and reservoir. 6/ That formula (set out in detail at Exam. Dec. 26-27), as it relates to this case, can be represented to call for payments to be made by Alabama equal to the following:

$$10(f)\ \text{costs} \times \frac{\text{Value of joint use facilities downstream}}{\text{Value of joint use facilities both downstream and at site}}$$

The 10(f) costs of Allatoona were stipulated by the parties (Ex. 24) and are thus not in issue. Nor does any dispute exist as to the basic method of calculating the value for power of the joint use facilities downstream, which is as follows: Once the energy gains to Alabama's Coosa river plants are known, the incremental costs of producing such energy incurred at the hydroelectric projects are determined. These costs are then compared with an estimate of the higher incremental costs which Alabama would have incurred by generating the same amount of energy at alternate steam-

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6/ The dam and reservoir, which have value to the production of power both at site and downstream, are referred to hereinafter as the "joint use facilities", whereas the facilities which relate solely to the generation of power at Allatoona--which include the power house and equipment, power intake works, tailrace and switchyard structures and equipment (Exam. Dec. 27)--are referred to as the "specific power facilities." Annual charges relating to the specific power facilities are not allocable under Section 10(f).

electric sources had the energy not been produced at the four Coosa river plants. The difference between the incremental costs--*i.e.*, the savings in generation costs realized by Alabama--is the "value of the joint use facilities downstream" called for by the formula. The objections raised by Alabama in this Court relate to the determination of the value of the joint use facilities to the United States at Allatoona.

A Staff witness at the hearing noted that the Secretary, through the Southeastern Power Administration, sold the power generated at Allatoona at rates designed to recoup the sum of the total annual costs of the specific power facilities and the portion of the costs of the joint use facilities to be borne by power. 7/ The Staff had determined that the value for power of the joint use facilities at site consisted solely of the costs of the joint use facilities to be borne by power, 8/ as they represented the sole power income to the

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7/ Part of the costs of the joint use facilities are allocated to flood control and irrigation.

8/ These joint use facilities costs are slightly higher than the 10(f) costs as they include operating, interim replacement and insurance costs in addition to the interest, maintenance and depreciation charges to be apportioned under Section 10(f).

United States attributable to the joint use facilities (H. 135). The witness noted that the same method for calculating value at site had been used both in the previous Coosa river headwater benefit determinations and in proceedings involving other river basins (H. 135).

Alabama, in its presentation, claimed that the annual costs of the specific facilities should be included in determining the at site value of the joint use facilities, reasoning that the formula called for the full value of the power produced at Allatoona (H. 275-276).

The Examiner rejected Alabama's contention, holding that as no portion of the costs of the specific facilities had been included in the 10(f) costs to be apportioned, the specific facilities costs could not be included in the formula intended to measure benefits bestowed by the 10(f) costs (Exam. Dec. 28). The Commission summarily approved the Examiner's decision on this point, referring to the prior consistent practice of the Commission (Dec. 5).

ARGUMENT

I. THE COMMISSION PROPERLY CONSIDERED AND REJECTED THE EXISTENCE OF WEISS IN CALCULATING THE ENERGY GAINS REALIZED AT ALABAMA'S LAY, MITCHELL AND JORDAN PROJECTS

A. <u>In order to Promote the Most Economical Utilization of Power Resources, a New Hydroelectric Project Should Only Be Given Credit for the Incremental Headwater Benefits Which it Bestows on Downstream Projects Over and Above the Benefits Already Provided by our Existing Project</u>

Alabama emphasizes throughout its brief that the addition of the Weiss project to the Coosa River was but a step in the continuing development of the Alabama-Coosa River Basin pursuant to a comprehensive plan, and, indeed, the Commission so found in its order issuing a license for the project. <u>Alabama Power Company</u>, 18 F.P.C. 257, 270. With this notion, we have no quarrel. But to say a given hydroelectric project is a part of a comprehensive plan does not answer the question as to whether, when and under what circumstances the project should be developed. In our view, the construction of each improvement on a river should be undertaken only after a determination has been made that the total benefits (including so much of the headwater benefits which are incremental) to be derived therefrom, when weighed against the aggregate costs of the project, compare favorably with similar

cost-benefit analyses of alternate methods of producing similar benefits. 9/ To permit, as Alabama's position in this case would seem to sanction, the addition into the benefit side of the analysis a significant portion of benefits which are already being provided by another project would give a false picture of the economics of the project. A project would be credited with "benefits" adding nothing to the aggregate power generation potential of a river.

9/ Obviously, the cost-benefit analysis made by a private power company contemplating a given hydroelectric project will differ from the analysis the government would make were it contemplating construction of the same project and from the analysis the Commission would make in deciding whether to license the project. In the latter two cases, benefits other than power--such as flood control and navigational benefits--will be weighed whereas a power company would consider only power benefits for which it receives compensation. Presumably, in authorizing the non-federal development of the Coosa River, Act of June 28, 1954, P.L. 436, 68 Stat. 302, Congress was of the opinion that the power benefits alone would make it worthwhile for private power companies to develop projects which would also provide flood control, navigational and other benefits. No matter what analysis is being made, however, we believe it equally important that the projected benefits considered in a feasibility study be limited to the net benefits added by the project.

By the time Weiss was operating, Allatoona had been providing the lower three projects with headwater benefits for over 10 years. The addition of Weiss resulted in increased Coosa-Etowah River electric energy generation in two ways: First, its own turbines were placed in operation and, second, its capacity for storing water enabled the Lay, Mitchell and Jordan dams to generate more energy than they would have been able to generate under Allatoona regulation alone. In accordance with sound resource utilization policy, the Commission correctly determined, in effect, that only the incremental increase in benefits to the three downstream dams should be credited to Weiss. Alabama's point that Allatoona should be given credit only for the net benefits it provides over and above the benefits provided by Weiss regulation would defect such policy.

B. In Addition to Being Justified by Resource Utilization Policy, the Commission's Method of Determining Benefits was Reasonable and is not Inconsistent with Past Commission Practice

1. Not inconsistent with past Commission practice

Alabama charges (Br. pp. 15-16) 10/ that this case represents the first time that the Commission has departed

10/ "Br." references are to Alabama's brief.

from its practice of comparing actual energy generation against projected energy generation assuming the headwater improvement was not on the river. See South Carolina Electric & Gas Co. v. Federal Power Commission, 338 F. 2d 898, 904 (C.A. 4, 1964); Virginia Electric & Power Co., 37 F.P.C. 340, 346 (1967). As the Examiner pointed out (Exam. Dec. 8), the above cases involved only one hydroelectric project downstream from a federal project and were thus inapplicable to the instant case. The Commission thus had to approach this case as one of first impression and was free to develop a procedure it felt was equitable and consistent with sound water resource development policy.

2. Alabama was "directly benefited"

Alabama raises the argument (Br. pp. 14-15) that it was not "directly benefited," within the meaning of Section 10(f), in that it never received the headwater benefits for which it is being charged. In essence, Alabama contends that because the Weiss reservoir re-regulates a substantial portion of the waters released by Allatoona, any benefits accruing to the three downstream dams from those waters are "received" from Weiss, not Allatoona. The short answer to this contention is that the Commission is not limited to such niceties of water tracing in determining what is

"equitable" under Section 10(f). The plain fact exists that before Weiss was built, Lay, Mitchell and Jordan were receiving some headwater benefits; now they are receiving greater benefits. We believe the Commission has the power under Section 10(f) to decide that equity and resource utilization policy demand that only the increment in benefits be attributed to the Weiss project.

3. The fact that changes in the functional operations of hydroelectric projects may <u>occur, does not require a different result</u>

Alabama points out (Br. pp. 21-22) that the functional operations of hydroelectric storage projects are frequently altered as a river is further developed and flood control and other public use requirements change. Specific reference is made to various changes in the allocation of the project costs of Allatoona to the power, flood control and irrigation functions of the federal dam. Such changing patterns, Alabama argues, makes it impractical and illogical to assess charges for benefits on a "first-in-time, first-in-right basis" (Br. p. 23).

The Commission's procedures, however, do not ignore such changes. Headwater benefit proceedings are concerned only with power generation. To the extent that Allatoona project costs allocable to power are changed, the 10(f) costs (interest, maintenance and depreciation costs allocable to power) to be apportioned are also changed. As far as the impracticability of computing benefits under the Commission's approach when new projects are added to a river is concerned, the Commission is free to develop appropriate procedures for making such calculations (which are liable to be complex under any system) when they arise. We note that in the instant case, the method employed by Alabama (projecting how Weiss would be operated in the absence of Allatoona) employs considerably more guesswork than the method adopted by the Staff (eliminating Weiss regulation in calculating energy produced downstream).

4. Coordination of the operations of Alabama's projects is no justification for preempting the benefits provided by Allatoona

Alabama stresses that Weiss is operated in close coordination with Lay, Mitchell and Jordan to maximize energy output whereas Allatoona is operated independently. The effect of such close integration, we submit, is to maximize

the net headwater benefits which Weiss is able to contribute to the Coosa River--for which Weiss receives full credit--over and above what Allatoona had been providing; it does not make out a case for allowing Weiss to preempt Allatoona's headwater function.

5. The same procedure would have been used
<u>had Allatoona been a non-federal project</u>

Alabama also argues (Br. pp. 20-21) that the Commission would use a different methodology to calculate energy gains if Allatoona were owned by another licensee, rather than by the government. To follow such a procedure, it is urged, would force one company to "subsidize" another. Such an argument begs the question. Section 10(f) requires the Commission to make an "equitable" assessment for headwater benefits; as long as its assessments are equitable, no question of subsidy arises. We would expect the Commission to apply procedures consistent with the ones in this case if either Allatoona or Weiss were owned by a licensee other than Alabama.

II. THE COMMISSION PROPERLY IGNORED THE FLOOD CONTROL CAPACITY OF WEISS IN CALCULATING THE HEADWATER BENEFITS RECEIVED BY WEISS

Although not treated as a separate issue in its brief, Alabama objects (Br. p. 16) to the fact that the Commission "intentionally disregarded" the electric energy generated from water temporarily stored in the flood control zone of the Weiss reservoir (see supra, pp. 12-14). Since Alabama's witness did not disregard such energy generation and since the amounts which Alabama suggests it should be ordered to pay (Br. pp. 5, 33) are based on the testimony of such witness (see Br. p. 5, n. 1), it is necessary to discuss the issue briefly.

As the record establishes, both Allatoona and Weiss have significant portions of their reservoirs reserved for flood control. Allatoona, which controls some 1,100 square miles of drainage area, has a flood control storage area above the maximum height of its power pool of 303,000 acre feet (H. 54); Weiss, which controls an area of some 4,173 square miles (exclusive of the area controlled by Allatoona), has a flood control capacity above its maximum power pool of 301,000 acre feet (H. 214-215). As we have explained, supra, pp. 12-13 , once a reservoir is filled to the point

where its flood control zone is invaded, certain operating procedures prescribed by the Corps of Engineers come into play. Such procedures, however, do not always demand that the water temporarily stored in the flood control zone be immediately discharged over the dam's spillway and consequently much of such water can often be used beneficially to generate electricity. Thus, if it could be assumed that the same flood control procedures as are now in effect would govern Weiss were Allatoona not on the river, Alabama would be perfectly justified in insisting that Weiss' flood control zone not be ignored in calculating the energy Weiss would have produced without Allatoona.

But it most emphatically cannot be assumed that Weiss would have been operated under the same procedures without Allatoona. The elimination of Allatoona would add 1,100 acres to the drainage area presently controlled by Weiss. To handle such additional acreage, it would seem safe to assume that the Corps of Engineers would either increase the portion of the Weiss reservoir reserved for flood control (and consequently reduce the size of the power pool) or require a faster discharge of water temporarily stored in the flood control zone, or possibly a combination of both

alternatives. The adoption of either alternative would obviously affect any estimates of the projected energy generation of Weiss without Allatoona.

In these circumstances, the Commission's decision to ignore the flood control zone constitutes a reasonable method of taking into account probable changes in flood control procedures. In essence, the Commission has held that, at the very least, the Corps of Engineers would require a speedy evacuation of the Weiss flood control zone if Allatoona were not operating and that therefore it is unreasonable to assume that water temporarily stored in such zone would be available for power generation.

III. THE COMMISSION PROPERLY INCLUDED ONLY THE COSTS OF THE JOINT USE FACILITIES IN THE FORMULA APPORTIONING 10(f) COSTS

Alabama raises no objections to the Commission's employment here of the "value" formula, which, it concedes, does not first allocate costs of joint use facilities (*i.e.*, Allatoona's dam and reservoir) between at site head and storage functions before allocating them among benefitted downstream projects as do other formulae developed by the Commission for headwater benefit determinations. Compare 18 C.F.R. 11.27(a) with 18 C.F.R. 11.27(b). The "value"

formula, set out as applicable here at p. 15 , supra, apportions 10(f) costs on the basis of the value of the joint use facilities to the downstream projects compared with the value of the joint use facilities both downstream and at site.

Alabama, however, does find fault with the Commission's determination of the at site value of the joint use facilities--i.e., their value to the government. As noted at pp. 16-17 supra, the Commission equated at site value to the costs of the joint use facilities alone. Stating that the value assigned to the downstream projects is "based on the cost of obtaining equivalent power from the most likely alternative source" and that "value of power at a federal project is equated to its costs," Alabama argues that the total costs of producing power at Allatoona--costs of both the joint use and specific power facilities--is the at site value called for by the formula (Br. pp. 26-27).

Alabama's contention misconceives the nature of the "values" which form components of the Commission's formula. The formula does not compare the value of the additional power produced downstream on account of Allatoona regulation with the value of the power produced at the federal project; rather, the formula compares the value of the joint

use facilities to the production of the additional power downstream with the value of the joint use facilities to the production of power at the federal project. The joint use facilities are of value downstream because they allow the downstream projects to produce additional power at a substantially lower incremental cost than the incremental costs which would have been incurred had the power been produced by an alternate steam-electric source. The "value" downstream is actually the savings in power generation costs realized, measured by the difference in the two incremental costs. The joint use facilities are of value to the federal Allatoona project in that they contribute, together with the specific power facilities, towards the production of power at the federal project. As the total value of the power produced at Allatoona is equivalent to the costs of both the joint use and the specific facilities, the "value" at site of the joint use facilities towards the production of federal power is equal to the costs of the joint use facilities--the measuring rod used by the Commission.

Stated another way, the federal investment attributable to power in the dam and reservoir of Allatoona results in savings to Alabama (measured by differences in incremental costs) and in a contribution towards the production of power at Allatoona. It is entirely reasonable that the costs of amortizing that federal investment and maintaining the dam and reservoir be apportioned on the basis of such savings and such contribution.

Once it is recognized that the Commission's formula compares the values of the joint use facilities to Alabama and the government, rather than the values of quantities of power produced, Alabama's remaining arguments are readily met. Whether or not the Fourth Circuit specifically considered and rejected the notion that specific facility costs should be included in at site valuations when it twice approved the use of the "value" formula, see South Carolina Electric & Gas Co. v. Federal Power Commission, 338 F. 2d 898 (1964), and Virginia Electric and Power Co. v. Federal Power Commission, 351 F. 2d 408 (1965), is inconsequential. The South Carolina Electric opinion carefully considered the various elements of the formula and their application and found the formula to be valid. 338 F. 2d at 905-906.

Nothing that Alabama has raised requires that holding of validity to be disturbed. Alabama's final contention that application of the formula places an undue portion of the 10(f) costs on Alabama's customers to the benefit of the customers of the United States is obviously without merit if, as we urge, it is concluded that the Commission's apportionment of 10(f) costs if equitable.

IV. THE COMMISSION DID NOT ABUSE ITS DISCRETION IN REJECTING ALABAMA'S ARGUMENTS

As Alabama correctly points out, the standard adopted by Congress under Section 10(f), requiring reimbursement for "such part" of annual interest, maintenance and depreciation charges "as the Commission may deem equitable," is very broad. Although for the most part, the issues raised by Alabama on this review are not essentially issues of fact and thus are not governed by the substantial evidence test, see 16 U.S.C. 825<u>l</u>(b), the resolution of the policy issues presented is a matter within the expertise of the Commission and should not be disturbed merely because others might resolve the issues differently. See <u>South Carolina Electric & Gas Co</u>. v. <u>Federal Power Commission</u>, 338 F. 2d

898, 906 (C.A. 4, 1964). As the Supreme Court has stated in another context (Permian Basin Area Rate Cases, 390 U.S. 747, 767 (1968)):

> A presumption of validity * * * attaches to each exercise of the Commission's expertise, and those who would overturn the Commission's judgment undertake "the heavy burden of making a convincing showing that it is invalid because it is unjust and unreasonable in its consequences." FPC v. Hope Natural Gas Co., [320 U.S. 591, 602].

CONCLUSION

For the foregoing reasons, the petition for review should be denied.

Respectfully submitted.

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JULY 1970.

IN THE UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 24067

Alabama Power Company, Petitioner

v.

Federal Power Commission, Respondent

United States, on behalf of the Secretary of the Interior, Intervener

ON PETITION TO REVIEW AN ORDER OF THE FEDERAL POWER COMMISSION

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JULY 31, 1970

INDEX

	Page
Counterstatement of the issue presented ----------------	1
Counterstatement of the case ---------------------------	1
The decisions ------------------------------------	4
Argument	
The Commission's assessment of headwater benefit payments was soundly based ----------------	9
A. The Commission's determination of the amount of energy gains accruing to Alabama Power's project attributable to the headwater improvement at Allatoona was reasonable --------------	11
B. The Commission's application of its value formula for dividing the total annual costs of the headwater improvement was sound --------	17
Conclusion --	20

TABLE OF CITATIONS

<u>Cases</u>:

<u>First Iowa Hydro-Electric Cooperative</u> v. <u>F.P.C.</u>, 328 U.S. 152 (1946) ----------------------------	9
*<u>South Carolina Electric & Gas Co</u>., 29 FPC 624 (1963), affirmed 338 F. 2d 898 (CA4, 1964) ------	17-19
<u>Southern California Edison Co</u>., 1 FPC 567 (1939) --	10
<u>Virginia Electric & Power Co</u>. v. <u>F.P.C.</u>, 351 F. 2d 408 (CA4, 1965) ----------------------------------	17

---

* Cases or authorities chiefly relied upon are marked by asterisks.

Cases--Continued: Page

Virginia Electric & Power Co., 37 FPC 340 (1967) -- 17

Statutes:

Act of June 23, 1910, Ch. 360 §1, 36 Stat. 594 ---- 10,11

Federal Power Act, Act of June 10, 1920, 41 Stat. 1063, as amended, 16 U.S.C. 791-825r:

Section 10(f), 16 U.S.C. 803(f) ---- 1,2,7,9,10,13,15,18

Miscellaneous:

45 Cong. Rec. 5684 (1910) ------------------------ 11

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of the Federal Power Commission

BRIEF FOR THE FEDERAL POWER COMMISSION

COUNTERSTATEMENT OF THE ISSUE PRESENTED

Whether the Commission's assessment of headwater benefits was reasonable and consistent with the provisions of Section 10(f) of the Federal Power Act.

COUNTERSTATEMENT OF THE CASE

Petitioner, Alabama Power Company (Alabama Power), challenges the order of the Federal Power Commission issued December 17, 1969, 42 FPC 1124 (soon to be reported), which determined that Alabama Power's equitable share of the annual charges for interest, maintenance, and depreciation during the period 1961-1963 for that portion of the federally owned Allatoona Dam which supplied headwater benefits to four downstream facilities

licensed to Alabama Power amounted to $287,867. 1/ (R. 4556).

Under Section 10(f) of the Federal Power Act, 16 U.S.C. 803(f), whenever a licensee or permittee of a hydroelectric plant is directly benefited by the construction work of another licensee, permittee, or of the United States of a storage reservoir or other headwater improvement, the Commission shall require the licensee or permittee so benefited to reimburse the owner of the headwater improvement for an equitable part of the annual charges for interest, maintenance, and depreciation on the headwater improvement (hereinafter referred to as Section 10(f) costs).

Alabama Power maintains, under license from the Commission, the Weiss, Lay, Mitchell, and Jordan Dams. These plants are located downstream from the federally owned Allatoona Dam. The Allatoona Dam, completed in 1950, is located about 48 miles upstream from Rome, Georgia, on the Etowah River. Constructed primarily for flood control purposes by the Corps of Engineers, Allatoona also produces hydroelectric power, which is marketed by the Southeastern Power Administration, an agency of the Department of the Interior, and serves recreational purposes (R. 53-54). The Weiss project, one of several new developments

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1/ The Commission also determined that the cost of making this determination was $30,000 (R. 4556). Under the statute, Section 10(f) of the Federal Power Act, 16 U.S.C. 803(f), "the licensees or permittees affected shall pay to the United States the cost of making such determination as fixed by the Commission." Petitioner has not challenged this amount.

planned by Alabama Power under Project No. 2146, licensed by the Commission in 1957 (18 FPC 257), is located on the Coosa River, 130 miles downstream from the Allatoona project. Weiss, completed in 1962, is classified a storage project and has three hydroelectric generating units totaling 87,750 kilowatts (R. 55). The Lay Dam project is a run-of-river 2/ development located about 160 miles downstream from Weiss. The project began operation in 1914 and has six hydroelectric generating units totaling 81,000 kilowatts of generating capacity (R. 56, 88, 1177). The Mitchell Dam, a run-of-river hydroelectric development located 14 miles downstream from Lay Dam, was completed in 1923. The project has four generating units totaling 72,500 kilowatts of generating capacity (R. 57, 1177-1178). The Jordan Dam, a run-of-river hydroelectric development located 19 miles downstream from Mitchell was completed in 1929. Jordan has four generating units totaling 100,000 kilowatts of generating capacity (R. 57, 1178).

Assessments for headwater benefits to Alabama Power's plants downstream from the Allatoona project have been made against petitioner for the period 1950-1960 in previous Commission proceedings. 13 FPC 1317 (1954), 16 FPC 827 (1956),

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2/ A run-of-river plant is a hydroelectric power plant utilizing pondage of the flow of the stream as it occurs in contrast to a storage plant which is a hydroelectric plant associated with a reservoir having power storage. (R. 4219-4220). Each of the developments below Weiss, *i.e.*, Lay, Mitchell, and Jordan, has some at-site storage which is used mainly as daily pondage in order to obtain maximum peaking generating capability (R. 57-58, 108).

22 FPC 749 (1959), 27 FPC 398 (1962). On September 28, 1966, the Commission issued a determination that Alabama Power's equitable share of the Section 10(f) costs of Allatoona based on the headwater benefits provided during the period 1961-1963 amounted to $296,003. 36 FPC 701. Petitioner filed an application for rehearing claiming that the award was excessive. It alleged, inter alia, that priority was not given to storage available in Alabama Power's downstream projects. The Commission granted this request on November 23, 1966 (36 FPC 883) and public hearings were held.

The decisions. -- On March 25, 1969, the initial decision of the examiner was issued (R. 4292-4322). During the hearings, all the parties recognized that the Allatoona project contributed substantial energy gains to Alabama Power's downstream projects, but the amount of such gains was in controversy. In addition, the Commission's staff and the Secretary of the Interior claimed that Allatoona increased the capacity of the downstream projects. While the examiner concluded that capacity benefits had been demonstrated, the Commission agreed with the company that the record did not support such capacity gains and that finding is not at issue here.

In estimating the amount of energy gained at a downstream plant from the regulation of water flow by an upstream plant or plants, a determination is required of what the flows would have been at the downstream plant if the stream were unregulated and how the plant would have operated with the unregulated flows. It must then be determined how the downstream plant is affected

by the regulation of flow from the upstream reservoir or reservoirs and how it operates under regulated conditions. This is computed by taking the daily flows at the downstream plants and adjusting them for the upstream regulation (R. 4297). Thus, if on a given day, the upstream project stored water, the natural flow was reduced and the flow at the downstream plant was reduced, adjusting for travel time. If the reduced flow results in a loss in daily generation, a negative energy gain results. If water is released from storage, flow at the downstream plant is increased. If the increased flow results in an increase in daily generation, an energy gain results. The difference between the total energy gains and the negative energy gains is the net energy gains attributable to upstream regulation.

In the present case this determination also had to take into account that there were two upstream storage reservoirs which could contribute gains in energy over the generation possible with no regulation of stream flow. In this respect, the examiner adopted the position of the Commission staff, concurred in by the Department of the Interior, an intervener below and in this Court, that in determining the effect of Allatoona regulation on the energy generation at petitioner's downstream Lay, Mitchell, and Jordan plants, the recorded flows at these plants must be adjusted by the amount of regulation provided by the Weiss project. Elimination of the effect of Weiss regulation on the downstream projects was necessary to

show the true effect of Allatoona regulation and to insure against the possibility of crediting Allatoona with energy gains obtained solely from Weiss (R. 4298). Energy gains accruing to petitioner from the regulation at Allatoona were determined by the staff to amount to 193,324,333 Kwh (R. 4298).

Alabama Power presented its own study claiming that energy gains from Allatoona amounted to 147,927,904 Kwh (R. 4299). The difference in these two determinations was basically due to the methodology used in computing energy gains. 3/ The company estimate was arrived at by calculating the energy that its downstream plants would have produced without Allatoona regulation and then subtracting this amount from the actual metered generation at the plants. The examiner, noting that petitioner's method "would allow Weiss to preempt a portion of the headwater benefits which Allatoona is and has been furnishing the Lay, Mitchell, and Jordan plants since Congressional action

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3/ In addition to the different methodologies used in computing energy gains, petitioner also used a method different from the staff's in determining and applying the relationship between turbine flow and energy generated. Petitioner's method was accepted by the examiner (R. 4302-4303) and the Commission (R. 4545-4546). The examiner and Commission also accepted petitioner's claim that adjustments should be made in the turbine capacity at the Jordan Dam to reflect the installation of steel turbine runners (R. 4304, 4546). However, petitioner's attempt to adjust the benefits supplied by Allatoona by claimed storage at Lay, Mitchell, and Jordan were rejected by the examiner (R. 4305). Similarly, petitioner's proposed adjustments to reservoir volume to cover the effects of evaporation, rainfall evapotranspiration and ground water storage were rejected by the examiner (R. 4305-4307) and the Commission (R. 4546-4547). Petitioner did not contest rejection of these modifications in its application for rehearing (R. 4574-4600).

placed it upon the river's system in 1950" (R. 4299), decided that the staff's methodology was more reasonable and appropriate based on the facts presented.

While the parties stipulated that the Section 10(f) costs of the Allatoona project allocated to power 4/ were $1,762,732 (R. 4318), and that the so-called value formula (<u>infra</u>, pp. 17-18) should be used to determine Alabama Power's equitable share of these costs (R. 4317), there was disagreement with respect to how that formula should be applied. Under the value formula a downstream plant's share of the Section 10(f) costs allocated to power is the ratio of the value of energy benefits received by it to the total value of energy benefits received from the headwater improvement by all downstream plants and at site. While there was agreement on application of most parts of the formula, the parties disagreed as to the proper value for the annual monetary value of the Federal headwater improvement to at-site power production. The staff and Interior position was that this was equal to the cost of the dam and reservoir at Allatoona allocated to power. Petitioner contended that the cost of specific power facilities including the powerhouse and equipment, power intake works, tailrace, and switchyard structures and equipment required to generate power at Allatoona should also be added to this amount.

4/ Allatoona, as is true with many headwater improvements, was not constructed solely for power. Under the formula, only the portion of the total annual interest, depreciation, and maintenance costs of the headwater improvement allocated to power are subject to further allocation among the various power beneficiaries. In this case about 31 percent of the annual costs were allocated to flood control, and 69 percent to power (R. 1187-1189).

The examiner, noting that the staff's interpretation was consistent with past Commission practice, rejected petitioner's claim. The examiner reasoned that since the cost of these specific power facilities is excluded from the costs of the headwater improvement being divided among the energy beneficiaries, that cost cannot properly be included in a formula which is intended to measure the benefit received by the petitioner from the headwater improvement (R. 4318-4319). The examiner, therefore, recommended that the headwater benefit charges assessed against petitioner be set at $332,831, plus $29,212 as the cost of making the determination (R. 4437-4438). Exceptions to the examiner's decision were taken by petitioner and Interior.

After consideration of these exceptions, the Commission, on December 17, 1969, issued its opinion (R. 4536-4557) which modified the examiner's decision in some respects. The Commission, however, adopted the examiner's conclusion that in order to give full effect to Allatoona's presence and operation, energy gains at the downstream plants should be computed by eliminating the effect of the Weiss Dam (R. 4543). Petitioner's methodology would, the Commission stated, permit a project constructed downstream and later in time to cancel out or allocate to itself the benefits originally provided by the upstream headwater improvements. The Commission noted that Weiss was constructed with full knowledge of the headwater benefits potentially chargeable against the downstream plants and concluded that petitioner could not attempt to negate or usurp for its own benefit the value of the Federal headwater improvement (R. 4544). The Commission also

agreed with the the examiner's determination that the monetary value of the headwater improvement to Allatoona's at-site power production included only the joint-use facilities that provided benefit both at site and downstream and not the cost of the specific power facilities which provided benefit only at site (R. 4540).

As a result of the modifications made in the examiner's decision the Commission found that the monetary value of the energy gains received by Alabama Power from Allatoona during the period 1961-1963 amounted to $392,690 (R. 4550) and determined that an equitable assessment against petitioner for these headwater benefits would be $287,867 and $30,000 as the cost of making the determination (R. 4556).

Applications for rehearing, filed by Interior and petitioner, were denied on February 11, 1970 (R. 4608-4611). This petition for review followed.

ARGUMENT

THE COMMISSION'S ASSESSMENT OF HEADWATER BENEFIT PAYMENTS WAS SOUNDLY BASED

The Federal Power Act was enacted by Congress to provide a complete scheme of national regulation that would promote the comprehensive development of the nation's water resources. See, e.g., First Iowa Hydro-Electric Cooperative v. F.P.C., 328 U.S. 152, 180 (1946). As part of the comprehensive plan, Congress provided in Section 10(f) of the Act, 5/ that owners of non-federal

5/ Section 10(f) provides in full as follows:
[Footnote continued next page.]

hydroelectric projects benefited by the construction work of an upstream or headwater improvement by the United States or its licensee should help pay for that construction through such annual charges as the Commission might deem equitable. In this way, orderly and comprehensive watershed development was to be encouraged since such "financial support of headwater improvements by downstream beneficiaries extends the feasible limits of such improvements in the common interest." Southern California Edison Co., 1 FPC 567, 574 (1939). 6/ The Commission's determinations

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[Footnote continued.]

> That whenever any licensee hereunder is directly benefited by the construction work of another licensee, a permittee, or of the United States of a storage reservoir or other headwater improvement, the Commission shall require as a condition of the license that the licensee so benefited shall reimburse the owner of such reservoir or other improvements for such part of the annual charges for interest, maintenance, and depreciation thereon as the Commission may deem equitable. The proportion of such charges to be paid by any licensee shall be determined by the Commission. The licensees or permittees affected shall pay to the United States the cost of making such determination as fixed by the Commission.
>
> Whenever such reservoir or other improvement is constructed by the United States the Commission shall assess similar charges against any licensee directly benefited thereby, and any amount so assessed shall be paid into the Treasury of the United States, to be reserved and appropriated as a part of the special fund for headwater improvements as provided in section 17 hereof.
>
> Whenever any power project not under license is benefited by the construction work of a licensee or permittee, the United States or any agency thereof, the Commission, after notice to the owner or owners of such unlicensed project, shall determine and fix a reasonable and equitable annual charge to be paid to the licensee or permittee on account of such benefits, or to the United States if it be the owner of such headwater improvement.

6/ The origins of Section 10(f) can be found in the Act of
[Footnote continued.]

here were fully consonant with its obligation to provide an equitable sharing of the costs of headwater improvements.

A. The Commission's Determination of the Amount of Energy Gains Accruing to Alabama Power's Project Attributable to the Headwater Improvement at Allatoona Was Reasonable

While it is conceded that the federal storage project at Allatoona enables Alabama Power to generate substantially more electric energy than would be possible without Allatoona, Alabama Power contends (Br. pp. 14-24) that the Commission, in making its equitable determination of annual headwater benefit charges, improperly determined the amount of energy gains that should be attributed to the Allatoona improvement. There is no merit to this claim.

[Footnote continued.]

June 23, 1910, Ch. 360 §1, 36 Stat. 594 (1910). This statute, an amendment to the General Dam Act of 1906, authorized the Chief of Engineers and the Secretary of War "to fix and collect just and proper charge or charges for the privilege granted to all dams authorized and constructed under the provisions of this Act which shall receive any direct benefit from the construction, operation, and maintenance by the United States of storage reservoirs at the headwaters of any navigable stream, * * * wherever such shall be, for the development, improvement, or preservation of navigation in such streams in which such dams may be constructed." The purpose of this statute, according to Representative Stevens, the floor leader of the bill in the House of Representatives, was to insure that a private licensee who received benefits from a federal project would pay for these benefits. "We have endeavored to do the best we could to protect the interests of the public without placing any unjust or unfair restrictions upon the improvements of navigable streams or in any way checking or burdening the development of water power in this country. We want this done, but in doing it the public should not be required to furnish a goodly share of the benefits without receiving some return for it." 45 Cong. Rec. 5684 (1910).

Since its operations began in 1950, the Allatoona project has enabled Alabama Power's downstream plants at Lay, Mitchell, and Jordan to generate more energy than would have been possible without the regulation of the river provided by Allatoona (R. 102). In 1961, Alabama Power placed in operation the Weiss project located between Allatoona and its three other downstream plants (R. 102, 145). Allatoona regulates flow into Weiss and both Allatoona and Weiss regulate the flow to Lay, Mitchell, and Jordan. The Weiss project, besides providing energy from at-site generation, has resulted in some incremental downstream energy gains that would not have been possible with only the Allatoona regulation. Thus, for the post-1961 period here involved, the Commission was faced with deciding what portion of the energy gains at the Alabama Power plants should be attributed to Allatoona regulation and what portion to the regulation of the stream at Weiss (R. 102). The Commission, as had the examiner, adopted the position of its staff (R. 103-104, 146) and of the Interior Department (R. 501) that in computing the energy gains attributable to Allatoona the proper methodology here would be to treat the Weiss project as incremental to Allatoona (R. 4543). Because of the interposition of the Weiss project, this meant essentially that it was necessary to determine the generation that would have resulted from the natural stream flow as regulated by only Allatoona and compare that with the amount of generation if there had been only natural stream flow.

While some of the energy gains attributed to Allatoona by this method could probably also be produced by Weiss (absent

Allatoona), 7/ the Commission approach of crediting Weiss with only incremental gains was equitable and certainly consonant with the statutory design of encouraging comprehensive water power development. Hydroelectric projects are neither designed nor approved in isolation. Rather each project is intended to contribute to a rational plan for improving the nation's waterways, through the maximum utilization of the available water for power, consistent with navigational, flood control, recreational and other environmental needs. To justify a new project, it must obviously be shown that it will serve needs that cannot already be met by an existing development. Moreover, as we have pointed out, supra, p. 10, the Power Act recognizes that because projects are designed not simply for at-site generation but also to provide downstream benefits some of the costs of constructing a project should be borne by downstream beneficiaries.

If, as the Congress contemplated, the assessment of Section 10(f) charges is to encourage the rational and comprehensive development of the waterways by permitting a sharing of costs, this purpose cannot be accomplished if a developer's

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7/ The company, in its energy gain computation, determined the energy gains that would have resulted from natural stream flow plus Weiss regulation (without Allatoona regulation). Only the energy gains in excess of such computed gains were credited to Allatoona. However, in making its computation the company assumed that its storage operation for flood control would not have been affected by the absence of Allatoona; the examiner found this invalid (R. 4302). Accordingly, the extent of energy gains that might have resulted absent Allatoona is not only irrelevant but also largely speculative.

reasonable expectation of contributions to the cost of the headwater improvement from downstream beneficiaries can be defeated by the claim that a later constructed project was, at times, capable of providing some of the same benefits. On the other hand, since a later project is approved and constructed because of the additional benefits it can provide, its developer cannot reasonably expect compensation to the extent its services are merely duplicative. But that, of course, is precisely what petitioner is claiming here, even though no payments would actually be made to it because it owns Weiss as well as the three downstream projects here involved.

Petitioner's contention (Br. pp. 14-17) that the Commission's approach is invalid because it departs from the past practice of determining downstream energy gains on the basis of the actual energy generated is insubstantial. To be sure, as the Commission recognized (R. 4543), the mechanics of the energy gain computation were different from those in earlier cases where only one headwater project was contributing to the generation in excess of that possible from unregulated stream flow. While petitioner complains that actual generation was not used, the computation of the energy gains by simply taking the difference between actual generation and generation based on the unregulated river flow, as was done in the earlier cases, would have resulted in excessive gains attributable to

Allatoona because the actual generation stemmed in part from Weiss' contribution over and above Allatoona's capability. 8/

Alabama Power relatedly argues that the Commission's approach is invalid because its plants are allegedly not "directly benefited" by all the energy gains computed by the Commission within the meaning of Section 10(f) of the Act. This claim is also without merit. Section 10(f) specifies that "whenever any licensee hereunder is directly benefited by the construction work" of someone else, then as a condition of the license the Commission shall determine annual charges to be paid to the United States or its licensees for the headwater facility. Thus, if direct downstream benefits such as energy gains or increases in capacity are conferred, as opposed to merely indirect benefits resulting, for example, from improved flood control with a consequent population growth and increased electrical usage, Section 10(f) becomes applicable. But once it is shown that a particular project confers direct benefits on a downstream project, as Allatoona admittedly does, the Section provides no formula for determining annual charges except for specifying that they shall be an equitable part of the interest, maintenance, and depreciation charges of the headwater project.

8/ We note that the existence of the two storage facilities also necessarily required certain modifications in petitioner's application of the Commission's methodology. Thus, while petitioner complains that the staff recomputed energy gains, the company methodology similarly required a different reconstruction from that used on storage project cases. Specifically, the company had to reconstruct the river flow to eliminate the effect of Allatoona's regulation.

Alabama Power's reliance on the "direct benefit" language, which it takes out of context, accordingly has no bearing on the measure of the charges assessed. In any event, where as here energy gains stem from regulation by more than one project, the question of which project confers what portion of the total benefits is reasonably resolved by considering the context of the question. That is, of course, precisely what the Commission did here, as we have discussed above.

Alabama Power's contention (Br. pp. 21-24) that the Commission's determination here results in the creation of a hypothetical static relationship among plants on a river is also incorrect. Rather the Commission is simply giving effect to the incremental nature of additional plants. 9/ This does not mean, as petitioner implies (Br. pp. 21-22), that the capital costs of the headwater project may not be reallocated or that a downstream project's share of the total benefits conferred by the headwater improvements may not alter. But the fact that such changes can and do occur in the dollar amount of the assessment for headwater benefits fails to support Alabama Power's contention that the Commission should not consider a later-constructed project as incremental to an existing project.

9/ Petitioner's speculation (Br. pp. 22-24) as to the effect of these proceedings on future headwater benefit proceedings in the Alabama-Coosa River area is, of course, pure conjecture. The Commission's approach here of viewing additional plants as incremental to the existing network of facilities is a rational means of fulfilling the obligations imposed upon it by statute.

B. The Commission's Application of Its Value Formula for Dividing the Total Annual Costs of the Headwater Improvement Was Sound

After determining that benefits in the form of energy gains have accrued to Alabama Power's downstream plants from the operation of the Allatoona project, the Commission had to determine what portion of the annual interest, maintenance, and depreciation costs of the Allatoona project should be borne by the company. In making this assessment, the Commission and the examiner, as well as all the parties in this proceeding (R. 4540, 4317, 507, 220-221, 126-127, 52-53), used the so-called "value formula" that had been used in a number of prior cases. Alabama Power, while conceding the soundness of the formula and that it was applied here in the same manner as in earlier cases, 10/ claims the application is inequitable.

The value formula recognizes first that the only portion of the headwater improvement costs to which downstream beneficiaries should make a contribution are those relating to facilities which result in downstream benefits. In the present context, this means the costs of the Allatoona dam and reservoir. Other facilities at Allatoona, such as the powerhouse, specific flood control facilities and recreational

10/ This formula had been used in prior headwater benefit proceedings with both Commission and judicial approval. South Carolina Electric & Gas Co., 29 FPC 624 (1963), affirmed 338 F. 2d 898 (CA4, 1964); Virginia Electric & Power Co., 37 FPC 340 (1967). See also, Virginia Electric & Power Co. v. F.P.C., 351 F. 2d 408 (CA4, 1965).

facilities confer no benefits downstream and hence these costs are not allocated. The formula also recognizes that since the headwater facilities that confer power benefits to downstream plants are also used to produce power at the headwater site, it is appropriate to divide the total costs to be apportioned in the ratio of the value of the benefits received at any given plant to the total value of the power gains, at site and downstream, resulting from the headwater facilities whose costs are being apportioned. 11/

As to these principles there is no dispute. The sole dispute (aside from the amount of energy gains conferred to petitioner's plants by Allatoona) is in applying this formula, specifically, the appropriate value of the Federal headwater improvement to the at-site production.

To understand the nature of the controversy, it must be recognized that the annual value to the United States of the at-site power produced at Allatoona is considered to be equal to the total annual costs of producing that power. See R. 1189-1190; South Carolina Electric & Gas Co. v. F.P.C., 338 F. 2d

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11/ Expressed algebraically, the formula is: $Pn = Cp \frac{Vn}{(Vf + Vd)}$ where:

Pn is the payment to be made for headwater benefits received at a downstream plant. Cp is the total annual Section 10(f) costs of the dams and reservoirs to be borne by power both at site and downstream. Vn is the net annual monetary value of benefits received at a downstream non-federal plant. Vf is the annual monetary value of the federal headwater improvements to at-site power production. Vd is the net annual monetary value of benefits received at all downstream plants (R. 4317-4318).

898 (CA4, 1964). The components making up the total annual power costs are the annual costs of the joint-use facilities (the dam and reservoir) allocated to power, plus the annual costs of specific power facilities that are of value only to at-site power production. The Commission here, as it has done in previous proceedings when the value formula was used to determine assessments for headwater benefits, held that cost of the specific power facilities located at Allatoona should not be included in determining the value of the headwater improvement to at-site power production. This was plainly reasonable. For the value formula attempts to determine the total increase in value resulting from the headwater improvement (the dam and reservoir). Downstream this increase in value depends not on the total energy produced, but only on that portion of the energy which was made possible by the headwater improvement. At site, the value of the same headwater improvement (the dam and reservoir) is not the total annual value (or cost) of the power sold from the site but only the annual cost of the dam and reservoir allocated to power. The annual costs of the specific at-site power facilities, as we have seen, also contribute to the value of the power sold, but that portion of value of the power sold obviously does not stem from the headwater improvement. Accordingly, Alabama Power's claim that the monetary value from the headwater improvement to the at-site power production should include the costs of the specific power facilities is patently fallacious.

CONCLUSION

For these reasons, the order of the Commission should be affirmed.

Respectfully submitted,

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July 31, 1970.

In The

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 24067

ALABAMA POWER COMPANY,
Petitioner

v.

FEDERAL POWER COMMISSION,
Respondent

UNITED STATES, ON BEHALF OF THE
SECRETARY OF THE INTERIOR,
Intervener

On Petition for Review of Order
of the Federal Power Commission

REPLY BRIEF FOR PETITIONER, ALABAMA POWER COMPANY

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TABLE OF CONTENTS

Page

INTRODUCTORY STATEMENT 1

I. TO BE EQUITABLE, AN APPORTIONMENT OF CHARGES UNDER SECTION 10(f) MUST BE BASED UPON THE RATIO OF THE DIRECT BENEFITS RECEIVED BY THE LICENSEE TO THE TOTAL DIRECT BENEFITS STEMMING FROM THE HEADWATER IMPROVEMENT. 2

A. The Commission admittedly did not measure the direct benefits to the license accurately and therefore the determination is not equitable. 4

B. The Commission did not value the direct benefits to the United States on an equal basis with its valuation of direct benefits to the licensee and therefore the determination is not equitable . . . 9

CONCLUSION 13

In The

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 24067

ALABAMA POWER COMPANY,
Petitioner

v.

FEDERAL POWER COMMISSION,
Respondent

UNITED STATES, ON BEHALF OF THE
SECRETARY OF THE INTERIOR,
Intervenor

ON PETITION FOR REVIEW OF ORDER
OF THE FEDERAL POWER COMMISSION

REPLY BRIEF FOR PETITIONER,
ALABAMA POWER COMPANY

INTRODUCTORY STATEMENT

Petitioner Alabama Power Company has examined in detail the brief of respondent Federal Power Commission and the supporting brief of Intervenor the United States, on behalf of the Secretary of the Interior. As hereinafter set forth, these briefs confirm Petitioner's contentions that the order appealed from does not meet the statutory standard of "equitable" apportionment of charges to a "licensee" "directly benefited" by a headwater improvement.

I.

TO BE EQUITABLE, AN APPORTIONMENT OF CHARGES UNDER SECTION 10(f) MUST BE BASED UPON THE RATIO OF THE DIRECT BENEFITS RECEIVED BY THE LICENSEE TO THE TOTAL DIRECT BENEFITS STEMMING FROM THE HEADWATER IMPROVEMENT.

While the Commission in Opinion No. 569, by use of an apportionment formula, purports to base its section 10(f) determination on the ratio of the value of direct benefits received, both the Commission and Interior in their briefs state that the "directly benefited" language of section 10(f) of the Federal Power Act applies only to an initial finding by the Commission that a section 10(f) determination should be made; and that it has no relationship to the requirement of an equitable apportionment of the section 10(f) charges of the headwater improvement between the owner of the headwater improvement and the licensee directly benefited.

The Commission in its brief states that a finding of direct benefit to a downstream owner simply triggers the application of section 10(f). Commission brief, at 15. Interior ignores the direct benefit standard also and states that the determination is a matter within the expertise of the Commission. Interior brief, at 31.[1/]

1/ Interior, on the same page of its brief, states that Alabama points out that the section 10(f) standard is very broad. Interior, however, there postulates a standard very much broader than that postulated by Alabama. See Alabama brief, at 31.

If the "directly benefited" language of section 10(f) has no relevance to test the reasonableness of a Commission determination of apportionment of charges between two parties, how is the reasonableness to be tested? The only other standard suggested by the Commission is that, so long as the apportionment does not result in an award which exceeds the total benefits received by a licensee, the apportionment cannot be said to be inequitable. See section 11.31(c) of the Commission's Regulations, 18 C.F.R. §11.31(c). If that is the standard, downstream licensees and their power customers are indeed second-class citizens.

It is Alabama's position that to be equitable a Commission determination must attempt to apportion the section 10(f) charges in relation to the actual power benefits at site and downstream. This position is supported by the legislative history of section 10(f). In explaining the section to Congress on September 3, 1918, Representative Dill of the State of Washington stated:

> "If a dam is built to establish a reservoir for water to furnish power on one of these streams, it furnishes water for all dams below it, and whoever may happen to build a dam on a power site below should contribute to the cost of the reservoir dam <u>in proportion to the benefits received</u>. 56 <u>Cong</u>. <u>Rec</u>. 9916 (1918). (Emphasis supplied.)

Alabama recognizes that within the standard there has to be leeway. For instance, Alabama is not disputing the equation of value of at-site power with the allocated power costs at the

headwater improvement, although if an alternative steam plant were used for the federal valuation, as it is for valuation of Alabama's power gains, the "value of power" at the federal project for use in the formula would be much higher. To be equitable, however, an attempt must be made to relate the apportionment to direct benefits received.

A Commission determination of the proper apportionment of section 10(f) costs between two parties is not a matter of expertise or discretion which cannot be tested for reasonableness. And where, as here, the Commission assigns fictitious benefits from an upstream storage project to a downstream licensee and applies an apportionment formula in such a way as to weight its result against the licensee, the determination of the Commission cannot be held to be equitable and should be set aside.

A. The Commission admittedly did not measure the direct benefits to the licensee accurately and therefore the determination is not equitable.

Interior in its brief, at 18 <u>et seq</u>., discusses preconstruction evaluation of hydroelectric projects to determine "whether, when and under what circumstances the project should be developed." In such an evaluation it states that only the total new benefits to be realized by construction of the project should be considered. Interior then slides from this position to the position that Alabama should pay the United States for power benefits Alabama is able to provide for itself, on the

basis that the Allatoona project of the United States which is capable of providing certain benefits to Alabama was constructed prior in time to Alabama's Weiss project.

Section 10(f), of course, speaks in terms of direct benefits to a "licensee".

There is a distinction between pre-construction evaluation and the determination of an equitable headwater benefit payment to be made by the owner.of constructed hydroelectric projects to the owner of an upstream storage reservoir. The Commission and Interior have heretofore recognized the distinction when storage projects of the United States were constructed later in time than non-federal storage projects in a river basin.

Interior implies in its brief, at 21, that the only decided headwater benefit cases involved "only one hydroelectric project downstream from a federal project". In Alabama's brief the Columbia River headwater benefit determinations are cited. In the early Columbia River Basin determinations, the United States received substantial headwater benefit payments on behalf of federal storage projects based upon a determination which did not take into account the priority in time of construction of storage projects in the basin. Similarly, in the years after a coordination agreement was entered into in the Basin, and today, while there are much smaller spills of storage water calculated for the critical period, storage benefits are still apportioned to upstream

storage reservoirs without regard to the order of construction of the storage reservoirs.[1] The earliest storage reservoirs in the Columbia Basin were not built by the United States. The multiple projects and their dates of construction are listed in the staff reports referred to in the Commission's orders. 29 FPC 238, 239 (1963), 31 FPC 1044, 1045 (1964).

The method of apportioning storage benefits received at downstream plants to the various upstream storage reservoirs in the Columbia Basin was also used in the initial staff report in this proceeding. The report stated:

> Each reservoir (Allatoona and Weiss) was credited with attributable benefits resulting from its specific storage regulation as long as the hydraulic capacity of a downstream plant was not exceeded and no water was spilled.... However, under certain flow conditions, when the hydraulic capacity of a plant is exceeded, the benefits have been apportioned on the basis of the total volume of daily regulation at both reservoirs. (Exhibit No. 1, at 10)

It was only when Alabama protested that this apportionment principle is not applicable when a storage owner is also the owner of downstream benefited projects, since section 10(f) speaks in terms of direct benefits to a licensee, that the staff

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1/ The coordination agreement affecting projects on the Columbia River provides that:

> The increments of average annual usable energy gain or loss at each Project from storage shall be assigned to each upstream reservoir in proportion to the storage change at each reservoir. Pacific Northwest Coordination Agreement, at 44, (September 1964).

Parties to this agreement include the United States, five private power companies and eight municipal and public power districts.

changed its position to assert that storage benefits should be credited to the first storage project constructed on a river to the extent that it might have provided such benefits. It is Alabama's position that only storage benefits over and above what a licensee provides to its own downstream projects should be credited to the owner of another storage project.

The Commission postulates a new theory to support its holding that it is reasonable to base its headwater benefit determination on benefits which Alabama might have received from the United States but actually provided for itself. The Commission states that a developer of a headwater storage project is entitled not to have defeated its "reasonable expectation" of contributions from downstream beneficiaries to the cost of its headwater improvement. Commission brief, at 13-14.

If this new principle is to be followed, what was the "reasonable expectation" of contributions from downstream projects to Allatoona's dam and reservoir at the time Allatoona was developed? There is no evidence of any such "expectation" in the record and, so, no way in which to test its reasonableness. If a "reasonable expectation" were to be established, would it set an upper limit on contributions from downstream owners? Was the "reasonable expectation" met by the construction of the Weiss project?, the raising of the power pool

elevation of the Jordan and Lay projects?, by the construction of H. Neely Henry Project?, of the Logan Martin project?, of the Walter Bouldin project? to mention just the projects undertaken by investment of Alabama, itself, on the Alabama-Coosa River since the construction of Allatoona. Must Alabama pay headwater benefits in connection with all of these new projects based upon the same fictitious type of computation on the theory that Allatoona reasonably expected Alabama to construct these projects and make a contribution on such basis?

If the new principle of "reasonable expectation" is valid in the Alabama-Coosa River Basin, is it to be followed also in the Columbia River Basin and other river basins in the country? Apparently Interior feels that it would now be to the benefit of the United States if it were. Interior brief, at 24.

Alabama submits that it is not the "reasonable expectation" of the owner of a storage reservoir which should now be made the basis of a headwater benefit assessment under section 10(f) of the Federal Power Act, but rather, that the basis should continue to be the actual benefits received by a licensee which it would not receive in the absence of the upstream storage

reservoir.[1]

B. The Commission did not value the direct benefits to the United States on an equal basis with its valuation of direct benefits to the licensee and therefore the determination is not equitable.

The Commission's brief states the formula as Alabama understands it and has accepted it for purposes of this case: namely,

> ". since the headwater facilities that confer power benefits to downstream plants are also used to produce power at the headwater site, it is appropriate to divide the total costs to be apportioned in the ratio of the value of the benefits received at any given plant to the total value of the power gains, at site and downstream, resulting from the headwater facilities whose costs are being apportioned." Commission brief, at 18.

1/ The statement in the Commission's brief starting at the bottom of page 14 is misleading on actual energy gains in that it assumes, as staff did in its computation, that the Weiss project was not constructed. The statement in footnote 8, page 15, is also misleading in that the fact that there were two storage reservoirs involved in this case did <u>not</u> cause Alabama to depart from Commission methodology in computing what would have been the natural inflow to Alabama's first project downstream from Allatoona in the absence of Allatoona. Section II of Interior's brief, starting at page 25, argues that the Commission properly ignored the actual operation of the flood control storage at the Weiss project in purporting to determine the actual energy generation at Weiss. The only evidence of record on this issue was presented by an Alabama witness who concluded that the Weiss flood control storage would have the same availability for power use with and without Allatoona (Hearing, at 760-761, 810-812). While Alabama has been faulted for not consulting with the Corps of Engineers on the subject, a witness from the Corps of Engineers would certainly have been available to the Commission or Interior if either felt that he might contradict Alabama's witness. In the absence of such a witness, it would not seem safe to assume that he would contradict the evidence of record, as Interior suggests in its brief at 26.

In Opinion No. 569 the Commission based its determination of the value of benefits received by Alabama on the cost to Alabama of producing equivalent power at alternative steam electric generating plants. The only benefit received by Alabama from Allatoona, however, is the storage and release of water. In order to derive power benefits from such storage releases, Alabama's investment in dams (to provide head) and powerhouses and equipment, power intake works, tail races and switchyard structures and equipment are necessary This investment of Alabama, however, is ignored in determining the value of benefits to Alabama. This is in accord with Alabama's understanding of the formula.

The brief goes on to state, however, that while

> ". . . it must be recognized that the annual value to the United States of the at-site power produced at Allatoona is considered to be equal to the total annual costs of producing that power. . . . At site the value of the same headwater improvement (the dam and reservoir) is not the total annual value (or cost) of the power sold from the site but only the annual cost of the dam and reservoir allocated to power The annual costs of the specific at-site power facilities, as we have seen, also contribute to the value of the power sold, but that portion of value of the power sold obviously does not stem from the headwater improvement." Commission brief, at 18-19.

The Commission then based its determination on the value of benefits received by the United States on the cost of the power gains at Allatoona reduced by the costs associated with the investment of the United States in the Allatoona powerhouse and equipment, power intake works, tail races and switchyard structures and equipment. These costs account for approximately

50% of the total costs (value) of power at Allatoona. This is <u>not</u> in accord with Alabama's understanding of the formula.

If it is obvious that the value to power of the United States' investment in specific power facilities at site should be excluded from the value of federal power in the formula, why is it not equally obvious that the value to power of Alabama's investment in dams and specific power facilities downstream should be excluded from the value of Alabama power in the formula? But no recognition is given to Alabama's investment and, therefore, the benefits to the United States and to Alabama are not valued on an equal basis.

Interior does not appear to accept the Commission's statement of the formula, although it agrees with the Commission's application of the formula. Interior's statement of the formula is as follows:

> "The formula does not compare the value of the additional <u>power</u> produced downstream on account of Allatoona regulation with the value of the <u>power</u> produced at the federal project; rather, the formula compares the value of the <u>joint use facilities</u> to the production of the additional power downstream with the value of the <u>joint use facilities</u> to the production of power at the federal project." (Emphasis in original) Interior brief, at 28-29.

If Interior's approach is followed, since value equals cost at a federal project, the value of the joint use facilities <u>to</u> power at Allatoona is correctly stated by it. The value of such facilities to Alabama, however, is not.

As noted, for Alabama's downstream plants the joint use facilities at Allatoona provide only a storage function. While

Interior limits the value to the United States of the head and storage at Allatoona's joint use facilities to the cost of the joint use facilities themselves and ignores federal costs associated with generating power, it uses the cost of energy as it leaves the generators of alternative steam electric plants, without deduction for Alabama's investment in its power producing facilities, to measure the value to Alabama of Allatoona's storage releases.

The contrast is made even more sharp when it is considered how Interior proposed to treat capacity gains at Alabama's downstream plants. As noted in Interior's brief, at page 8, footnote 4, Interior felt that Alabama had experienced gains in dependable capacity from Allatoona releases.[1/] To reflect these capacity gains in the formula, Interior proposed to add to the value of gains to Alabama in the formula the annual costs of investment in an alternative steam generating plant, including investment in boilers, turbines and generators to produce equivalent capacity. Again it would have given no recognition to Alabama's actual investment which produced the

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1/ While staff found that there were no dependable capacity gains (Opinion No. 569, p. 16) on rebuttal it introduced testimony as to "peak period capacity" gains, the latter term being a term of art under which energy available during the peak period is expressed in terms of capacity in the interchange contract between Alabama and its affiliates in the Southern System. The Commission upheld staff by finding that there were no capacity gains but rejected staff's contention that there were "peak period capacity" gains under the interchange contract. (Opinion No. 569, pp. 18-19).

power. In contrast, while the Allatoona joint use facilities do result in dependable capacity gains for the United States, under Interior's application of the formula the costs of turbines and generators at Allatoona are excluded in determining the at-site value component.

Alabama believes that the formula calls for an apportionment of the section 10(f) charges of Allatoona's dam and reservoir allocated to power in the ratio of the total value of power gains to the owner of any given plant to the total value of power gains to the owners of all plants, resulting from construction and operation of the headwater improvement. This would require that the costs of the specific power facilities at Allatoona be reflected in the value of power gains. If they are excluded, however, and as a result less than total value to the United States is used in the formula, the total value to Alabama obviously may not be used, if the formula is to make an equitable apportionment of the 10(f) costs.

CONCLUSION

For the foregoing reasons, Alabama submits that the Commission's order fails to meet the section 10(f) standard of an equitable apportionment having relation to the direct benefits received. The Commission's order should be set

aside, and Alabama ordered to pay the proper assessment noted in its opening brief.

Respectfully submitted,

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